MOTOR AGE

Vol. XXXI
No. 22

CHICAGO, MAY 31, 1917

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Three dollars a year

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Dependable Spark Plugs

Another Case Where Popular Demand Necessitates Carload Shipments of Champion Spark Plugs

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MOTOR COMPANY
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WHOLESALE
DES MOINES

April 25, 1917.

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Toledo,
Ohio.

Gentlemen:

We are glad to receive your letter of the 19th stating that our April carload of Champion spark plugs has left the factory.

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Yours very truly,

HERRING MOTOR COMPANY

O'Donald

Manager Accessory Sales.

ORM ELK

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MOTOR AGE

Published Every Thursday by the
CLASS JOURNAL COMPANY
Mallers Building
CHICAGO ILLINOIS

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, Under Act of March 3, 1897—Member of the Audit Bureau of Circulations—Copyright, 1917, by the Class Journal Co.

United States, Mexico and U. S. Possessions One Year $3.00
Canada .....One Year $5.00
All Other Countries in Postal Union.....One Year $6.00

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ANNOUNCEMENT

Next week Motor Age will contain a complete account of the Decoration Day speedway races at Cincinnati. The motor racing world is doing its part in the war, and in view of the fact that many of the racers and mechanicians may be among the first to go to France, their races previous to that departure are of unusual interest.

BEARINGS

The unfailing start at the touch of a button—the surge of silent power as the engine takes hold—the sure, swift speed acceleration—the "feel" of ample energy in reserve—all these things that make motoring most worth while are the things which distinguish the car of quality and reliability. And it can be no mere accident that these cars are, almost without exception, fitted with magnetos and lighting generators equipped with "NORMA" Ball Bearings. Remember—no car is better than its ignition and lighting generator. Therefore—

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Studebaker merchants are enthusiastic for the future, so are we, for Studebaker value is a bigger sales point today than ever before.

Minneapolis, Minn., April 23, 1917.
During the past two years we have had a wonderful business and when one stops to consider that in addition to all of the exports of every kind that we can spare, the Government is now spending billions of dollars, that is going through every channel of business, I cannot help but anticipate the most favorable business conditions imaginable.
Gray Motor Company.

* * *

Oklahoma City, Okla., April 23, 1917.
Our banks have more deposits than ever before. Everybody has employment. Our increase in the sale of Studebaker Cars was 146% in 1916 and we expect to make it 200% in 1917.
Reneau Motor Company.

* * *

Riverside, Cal., April 24, 1917.
Our time payments are in better condition and no more in number now than they were twelve months ago when we were doing half the business.
Glenwood Garage, C. A. Dundas, Mgr.

Idaho Falls, Idaho, April 25, 1917.
We are increasing our sales force as rapidly as possible and believe that every dealer should take advantage of present conditions by increasing his sales force and his local advertising—his business is sure to increase accordingly.
L. O. Naylor Company.

* * *

San Francisco, Cal., May 11, 1917.
Our sales so far this month indicate that May, 1917, will be the biggest month we have ever had. Buying is particularly brisk right at the present time.
Chester N. Weaver.

* * *

Seattle, Wash., April 25, 1917.
March, 1917, was the biggest month in volume of business this company has ever had. Our truck and commercial car business is five times greater than it ever was—we look for big business. We have prepared for it and we certainly expect to reap the benefit.
Waterhouse-Sands Motor Company.

STUDEBAKER

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It pays to be a *Studebaker* dealer

Vol. XXXI, No. 22 Chicago, May 31, 1917 $3.00 Per Year

MOTOR AGE

MOTOR TRUCKS *in the* U.S. ARMY

by Guy L. Jones

Noon mess finds drivers ready for whatever the cook offers

After a hard run those who man the convoys are ravenous

EDITOR'S NOTE—This is an intimate account of the inside details of conditions and service with the Pershing Expedition, written by a truckmaster of one of the companies of the motor fleet that went into Mexico in search of the bandit, Villa. Mr. Jones pictures what may be expected of those who are now enlisting to drive trucks in the Quartermaster's Enlisted Reserve Corps. He does not minimize the hardships encountered and it is evident that those who may perchance expect easy jobs as truck drivers and mechanics are likely to be disappointed

DETERMINED, exhausting, savage driving, characterized the use given motor trucks in the punitive expedition in Mexico, which, under command of Major-General John J. Pershing, U. S. A., crossed the border after the Villa raid on Columbus, N. M., just one year ago, and last month was disbanded at Ft. Bliss, Tex., after eleven continuous months in the field. That it failed to accomplish its purpose to "get Villa dead or alive" reflects no discredit on the officers commanding nor the men or trucks of the expedition, which were, apparently, restrained by orders from Washington, dictated by our friendly relations with the Constitutionalist government in Mexico. That it accomplished a wonderful revolution in the transportation department of the army, opened the eyes of officials to the wonderful possibilities of motor trucks, made a fine market for the factories, and resulted in the army being now supplied with several regiments of trains, when before it had scarcely a squad, were the main results of interest to the motor public.

Flapjacks such as his mammy used to bake

The first train reached the border about four days after the troops had crossed. It is said to have consisted of a train of Jeffrey Quads consigned to the French Government and commandeered by the War Department on its way to New York. The trucks arrived at the border by express, and a hastily gathered crew, some from the factory, some from El Paso, started with rations after the cavalry, already a hundred miles ahead. Each driver, like his soldier guard, was equipped with rifle, cartridges, infantry belt, canteen, mess kit, shelter half and blanket, which he flung into his truck as he climbed on. It was mostly "get there"; and the prob-

ems of living, eating, sleeping, shelter, rest, or return, were uncalculated in the order to "Go."

After time for organization thirty-three trucks constituted a train—it was twenty-six at first, based on the army tradition of the wagon train unit—the personnel developed to fifty-two men, a truckmaster, three assistant truckmasters, one mess sergeant, one chief mechanic and two assistants, thirty-three drivers, nine extra drivers, and two cooks, named last, but by no means the least important factor in successful train operation. With guards and passengers, officers and soldiers traveling back and forth over the line of communications, it took no small management, foresight, and organization to ration 125 men in an emergency, without tent, table, or kitchen, on a little field range out in all sorts of weather.

Seven Trains of Trucks

Seven trains were thus employed on the line of communications, though more than this number was purchased, and either worn out, broken up, consolidated, or sent elsewhere; types included Packard, White, Kelly-Springfield, Four-Wheel Drive, Jeffrey Quad, and demonstrators of Pierce-Arrow, Peerless, Dort, Christie, Sheldon, Lippard-Stewart, and GMC ambulances. Great shops were built at Columbus, for fifty cars under cover, and 250 in yard. Things became so systematized that gasoline was brought into Mexico for the field base at Colonia Dublan by rail. Two cars of a train were used for "chow," one for gas, one for water, one for mail, and one for repairs, leaving twenty-seven cargo trucks. When dispatched from Columbus, a train took the field with provision to sustain itself two weeks, but at first things were very disorganized.

The train which penetrated farthest south, away below Namaquipa, reached a trail in the mountains in the vicinity of the Cusi mines, near the branch of the Kansas City, Mexico and Orient railroad crossing from Chihuahua into the state of Durango, and found the way barred. Its coming had been much heralded; for perhaps three weeks cavalrymen had been with but one blanket, rations given out, mounts exhausted, always on the advance, searching with a fine-tooth comb, every ranch, pueblo, town, or mountain trail that might give a clue to the whereabouts of Villa. That train was going to bring them rations. It was the 10th cavalry, and the 10th are fine soldiers whose great interest is fatigue and chow. Tortillas, beans, dried beef, beef freshly killed, was all they had been able to rustle from deserted ranch houses. Corn was all they could get for the horses, no grass or hay, and very little corn. They were eating the corn themselves, burning it to make something to substitute for coffee; for the soldier on campaign, must have his big tin cup of hot coffee.

Every dust in the sky to the northward brought the hope, "that must be our rations." The train when it got there, was no train at all; two trucks. And the rations turned out to be a truck loaded with officer's bed rolls, and fifty cases of hardtack.

Guy L. Jones, the author, who served as truckmaster with General Pershing in northern Mexico. The Mexican sun is responsible for his companion

The hardest use to which trucks were put, was as line riders, one whole train of trucks being scrapped in that way. The signal corps ran their insulated wire from the reel right on the ground, following within a few hours the advance party leading down the main trail. Communication was at once established with a buzzer, for the camp commander. Within two hours the wire would be down, cut, broken by the step of a horse, destroyed by a suspicious Mexican. Right out after it, day or night, piled the signal corps man, with his party of six or eight soldiers, guns in their hands. The truck straddled the wire, and pounded away across country until the break was located. Stations every 20 miles had to be maintained, and the going was horrible. Where the road had followed a main water course, and the buzzer line had been laid higher up across the contributing water shed, little groups of cavalry were held for the impassable stretches. It was a service in which you must go; just as long as the truck could be revived by any possible devices, it was put through. Some of the 1½-ton trucks ran months after tires were gone, radiators leaking, gears smashed. Drivers with no hats, clothes torn to rags, no seat, hoods gone from engines, sides knocked askew, and tail gates missing, piled out at first call, and rolled off with lineman and escort, perhaps for two hours, and perhaps for all night and half the next day with nothing to eat.

The most novel use was that given the 3- and 5-ton trucks at Columbus, and later at El Paso, that of house moving; the long office buildings of headquarters being jacked up so that two, three or six trucks getting under and around it, they succeeded in crawling off with the building, like so many busy ants around a crumb of dry bread.

The elevation of Columbus being 4500 ft., the trail into Mexico ascended to 7400

A Mexican border barber shop. A truckmaster is shorn by a driver

Trying out civilians and enlisted men for appointments as drivers at Columbus, N. M.

Train of Riker 3-ton trucks which moved supplies to the Pershing base, averaging over 66 miles a day

Close-up view of the fleet of Rikers which operated over the border

Another sounding of revielle will be necessary to arouse the slumbering driver

at Namaquipa, and at that elevation are San Antonio, Santa Ysabela, where C. R. Watson, and party were massacred a few weeks earlier, the Cusi, Ojos Azules where Maj. Houze struck the Villistas celebrating the Cinco de Mayo, 1916, and Parral, where the 13th cavalry was fired on by Carranzistas, and recovered itself after three troops of the 10th rode 10 miles in 40 min. after the messenger arrived. It is very mountainous, lies west and south of the city of Chihuahua, and while in general the way passed along the center of high flat valleys, it was frequently broken by ragged washes, and involved two very narrow rugged canyons, affording inaccessible hiding places from which possible snipers could not be dislodged. It was in one of these locations that Ceravantes, a lieutenant-colonel of Villa, with a party, was met by an engineer detachment, looking for a new way around, and possibly some "slow deer." They found more exciting sport, and Cerevantes was not the only one brought in; his band was well armed and made a rush on the soldiers, who ducked behind the rocks. One was killed by the first fire, but one succeeded in making tracks for the camp at Las Cruces. When the rescuers arrived, the Mexicans had taken to the mountains and little remained beside bringing in the two bodies, and giving first aid to two of the Americans who had been slightly wounded. The Mexican wounded got away on their horses.

It is said that if Col. Scocum, who commanded the troops at Columbus the night of the Villa raid, some 70 men, had had at his order three trucks, he would have caught Gen. Villa. His men, as it was, followed the Mexicans 15 miles over the border to Boca Grande, probably exceeding, in a slight degree their orders. But they were hastily mounted, they went pell-mell after the raiders, were without rations, water, forage, blankets; the weather was severe in that altitude in March; they had to turn back to Columbus before their stock was injured. Had the three trucks been available, they would have overtaken the cavalry wherever the cavalry stopped, with hay, grain, water, rations and bed rolls; and by keeping on the go day and night, could have maintained a small force in the field, at a long distance from its base; at least until the mechanics of the department got the tape untied and the wheels going, to march the 10,000 troops off on their long journey. An infantry regiment sweated under the burning noon sun over the dry, dusty, burned plains, 400 miles below the border. It encamped at the Laguna Itscota—water so thick, dirty, and stale that sentries

Advance guard spotting deep holes in the quagmires near Ascencion to warn the rest of the train

Truck drivers line up each side of officer's car ready to start a long day's grind over roads far from good

paced the edges to caution against its use. Soldiers sat by the wayside, in a country where even the Mexicans ride, tying clean bandages about their feet; rivulets of perspiration streaked through the dust on their faces; many a roving eye besought a lift for heavy pack, belt, or rifle. And that same regiment turned its back on Mexico for its long weary return with the prize almost taken, with peace almost reassured in northern Chihuahua, with security almost restored to a long-suffering and gentle agricultural people, whose hearts, honor, and hearthstones have been ravaged by six years of blood-thirsty revolution, directed by the cupidity, avarice, and treachery of a small group of self-appointed leaders. The eyes of one truckmaster moistened and the hair on his neck bristled, at the pity and the futility of it.

The Trail of Villa

Dead horses easily indicated the trail taken by Villa especially at the camping places, where evidences of a few fires remained; but the dozen or so starved nags lying stark for a mile or two around, told the punishment they had been put to, on the flight south. Contact was nearly made with Villa's own body guard in the Galeana district, where the advance party of cavalry, after a hard ride from Casas Grandes, came to camp on the banks of the Rio Santa Maria, and prepared to rest their horses. A Mexican who was taken from his ranch nearby, to prevent his going ahead to give warning of the approach of the soldiers, said Villa had passed the night before. And in the evening, word was brought that Villa was resting in the little adobe town, two miles up the stream. Immediate pursuit was decided against, in view of orders, lack of supplies, lack of communications, or for other reasons, and Villa escaped.

* * * * * * *

"What the h—— is the matter with you? That break's a half mile long!" yelled the captain through the dust, as he surveyed the line of trucks. The Dodge runabout whirled across the flat. Explanations followed. The truck ahead, at an interval of 30 yds. was making it blinding; he was having trouble with his clutch; the pace kept his eyes in the road or he'd smash a wheel on a boulder; a fellow can't see through the back of his head; they were right there last chance he had to glimpse them; he'd been in whirlwind of sand, dust and noise all day, powdered from head to foot, nearly unrecognizable, a grey pillar save for his goggles. Well, next time. And when they closed up, he was off again, in the same roar, jolt, and concentration.

The rains brought a change. One morning the San Joaquin wash was a torrent. Engineer troops were on the farther side, signaling caution and working like beavers. The truckmaster rode the lead truck. A conference was held when the commanding officer came up. "I'll try it," said he. "Get a line." Wading carefully, he went down, but was pulled out. On the second attempt, keeping his feet, he found the old crossing and waded on. Securing the line to a tree and a brush, he marked the shallows and signaled to come on. Engineer soldiers piled in with boulders to fill the deepest holes. Ropes on trucks and fifty men on the rope when they died, and it was all morning's work, but the train went across.

A moving picture by flashlight of the work of crossing the cornfield near Ojo Carbajaleño one night last August when the rains were at their height, would make the fortune of a truck manufacturer; to drive out of the second story of a show room, into the city dumping lot, and keep on going, would be not harder than the service given. Road making by the engineer corps finally developed some pretty clever ideas, but while they were in process the going was not especially easy. Though the road had been cut badly, it was still being used. Boulders had been brought and laid as foundation for what later was an excellent causeway, filled with smaller ones, and finally with gravel from the wash. While the boulders were being brought, they were dumped in piles in the roadway. Heavy rains had soaked the plowed ground on either side so thoroughly a truck was on its front axle and differen-

Tank truck used for transporting gasoline and water with the Pershing expedition

tial housing in 6 yds. Water, too, filled the roadway, ruts, and sags. In the pitch dark and falling rain, torches waved, lanterns went out, men yelled and cursed; the rope was stretched from first one car and then another, for the "Heave all!" Toward eleven o'clock, drenched men, with nothing to eat, became so weary they fell over in the water. For the last cars, caution was abandoned. With the truckmaster's yell to "Step on 'er!" in his ears, the driver simply shut his eyes and hung on. If the truck bounced clear over the boulders, and the driver held his wheel, he simply dropped on the other side. Fire flew from clash of iron on stone when axle or differential struck. When the rushing, splashing car stopped dead with a jerk, crowbars, picks, and shovels came, prying or digging it off. Thirty shoulders gave it a mighty heave. The long line, or block and fall, dead-manned to two locked trucks ahead, got the heavy repair car over. And only a half a mile! It is interesting to note, that with this kind of usage, and long runs empty on the back haul, official records compiled in the office of the Base Quartermaster, U. S. Army, at Columbus, gave costs per ton mile ranging from 16 to 26 cents.

A word ought to be said about the character of the truckdrivers. Some were factory hands sent down from the plants with first shipment of trucks; some were garagemen, and drivers from city work. The best class, who had had in a different way the outside life of a soldier, were the ranchmen and cowpunchers, attracted by the high wages and temporary character of the employment. Like the Rough Riders of '98, they made the best men for the work. The soldiers, enlisted men of the regular army, having as a rule no interest in trucks before entering the service, did not prove especially apt, but the reservists who were called to the colors after the passage of the National Defense act, in June, proved good men, when assigned to motor transport service. Under the most trying conditions all the men faced the fatigue, exposure, hardship, danger, with one single idea, "put 'em through."

And now a word about the routine life of a truck driver as exemplified by the Pershing expedition convoy. An hour before daylight the cooks are astir. A day's run has to be made. The guard comes to warm himself, helping to get fires started. At 5.30 a. m. the crew is called, with bugle blowing reveille at the first crack of dawn. It is hard to "get them up"; but when a man is aroused enough to sense the fact that if he does not hustle, he gets no breakfast, it doesn't take so long. Bed-rolls are tied up and pilled on trucks and men form in line before the cooks, who serve into mess kits from a row of boxes and water cans, which answer for table. At the end is a boiler of steaming hot coffee. Breakfast is eaten on the ground, like lunch and supper. The whistle blows, and everybody is found present. While drivers are cranking up, the cooks load the ration cars, pack away the field range, save what is left of their wood, and then all "police camp."

The culinary art is studied closely by the hungry truck drivers

The whistle blows again, to "roll 'em over," and the lead car pulls out in the road. Thus begins the day's grind. Perhaps for an hour or two it is without incident. Then there is a stop behind, and one wonders what the trouble was, but they are coming again, so you go on. Stop again. You guess a carbureter service nozzle is choked with dust. You know you are, anyway. But they are coming again. Go ahead. For two hours it is unmitigated dust and roar, but the sun climbing high has taken some of the chill out of your legs, or else, as in summer, begun to burn you up, and you wonder what the cooks have got for lunch.

Part of the fleet of fifty-five Packard transport trucks plowing through the dust "Somewhere in Mexico," probably on the road from Columbus, N. M., to Casas Grandes

At eleven-thirty the lead car turns out on a nice hard place the driver has been watching for, and you say to yourself, "Noon." Grease cups to be turned up, and tires and springs inspected, and with mess kit in hand, you take your place in line. Beans, bread, canned fruit, and hot coffee, for a crafty mess sergeant has devised a fireless cooker out of a milk can and a tall box. You sit on the ground, finish your lunch, and have a smoke, congratulating yourself that it is not your steering wheel, or your radiator, or your spark plug that caused the delay.

Well, off again, and the incidents of the afternoon, like a bit of new road, seeing a troop of cavalry on the hike; passing groups of Mexicans or Chinese laborers under the watchful eye of engineer soldiers at work on the roads, turning out for a caterpillar road drag, or waiting while someone ahead repairs a breakdown, are much the same one day as another.

The cooks are busy with supper, which they are getting just as fast as they can. As it is getting dark, it is best to get one's bed roll located, and some of the stones and humps removed. After supper, you sit around the fire to smoke, and hear a few yarns spun. But the chuck holes were pretty bad, both this morning and this afternoon, and chuck holes make a tired driver. Best thing is to turn in, for an early start. We want to make field headquarters by noon. Taps are sounded and sleep is welcome.

Eliminates 5 Per Cent Tax from Bill

Senate Practically Rewrites Revenue Measure —Second-class Postage Clause Compromised

WASHINGTON, D. C., May 28—It is being generally asserted around the Capital that when the war revenue bill is rewritten by the Senate committee on finance and introduced in the Senate its father, Chairman Kitchin of the House ways and means committee, will not recognize it.

These predictions are beng based upon the statement by members of the Senate committee that the revenue measure will be revised and rewritten along lines entirely different from the House bill. The elimination of the provision providing for a 5 per cent tax on certain manufactures and that which proposes an increased rate on second class postage matter is assured now.

The issue of short-term bonds is most likely to be suggested by the Senate committee to provide the revenue which the rejection of numerous sections of the House measure will make necessary.

Reduction Is Favored

All members of the Senate committee are said to regard material reduction of the House revenue measure's $1,800,000,000 total as necessary and certain. The consensus in the committee apparently favors a total of between $1,250,000,000 and $1,500,000,000, determination of the exact amount to await detailed consideration of the bill.

Committee sentiment undoubtedly is strongly against what has been termed the House taxation of special industries. For the motor vehicle manufacturers' tax, a flat, graduated annual tax upon machines, whether in possession of manufacturers, distributors, or individuals, ranging from $2 for cheap cars to $20 or $25 for high-priced ones is under consideration. Final action on this proposition, though, is entirely in doubt, the only apparent certain action being the elimination of the 5 per cent tax.

Adoption with little change of the income tax schedules of the House bill other than the retroactive provision is said to have been virtually decided upon by the committee. The increase of about one-fourth taxes on incomes over $40,000 provided in the Lenroot amendments is opposed strongly. Elimination of the retroactive tax on 1916 incomes, Senator Simmons estimated, alone would result in reduction of the House bill's tax levy by $108,000,000.

Newspapers and magazines have fought vigorously the proposed zone system increase, declaring they would be ruinous to many publications. The loss of revenue by elimination of the section will be partly if not wholly recouped, the committee believes, by the proposed 2 per cent tax on all advertising.

A fair excess profits tax principle, the commtteemen say, will be adopted, which will relieve this year's tax burden upon business interests generally and provide a more equitable basis of taxation and also increase by many millions the net revenue returns.

Some corporations have complained that not until last year or this have they made normal profits. While not finally decided, the committee apparently favors retaining the House rate of 16 per cent on excess profits over earnings of 8 per cent but with invested capital abandoned as the basis of taxation calculation and the period of years' average substituted.

Consideration is being given a tax on parcel post packages smaller than that on express shipments. A parcel post tax, senators say, would be considered a freight rather than a postal tax.

In deciding to strike out the second class postage zone increase, the committee believed this is more a matter of postal administration than of taxation.

Nation's Dealers Unite

WASHINGTON, D. C., May 26—The first steps in the formation of the National Automobile Dealers' Association were taken last night in the New Willard hotel by the representatives of a number of associations in large cities, who are here opposing the proposed 5 per cent tax on motor cars. Their opposition thus far promises to have some results.

To push through the national association movement a committee was formed, the chairman of which is George W. Browne, Milwaukee, who distributes the Overland in Wisconsin. The secretary is Ernest T. Conlon, secretary of the Grand Rapids association. This committee is to get in touch with all the associations throughout the United States and arrange for a general organization meeting before Aug. 1. At that time the work will be perfected and permanent officers chosen.

To draft a tentative constitution and by-laws these men were made a committee: G. A. Will, attorney for the Minneapolis association; Bart J. Ruddle, secretary of the Milwaukee association; Ernest T. Conlon, secretary of the Grand Rapids association; Edwin B. Bodley, attorney for the Chicago association, and E. E. Peake, secretary of the Kansas Cty association.

The organizations which sent representatives to Washington to oppose the tax and which were represented at the time of the association meeting are: Minneapolis Automobile Trade Association, G. A. Will, attorney; Milwaukee Automobile Dealers, Inc., George W. Browne, director, and Bart J. Ruddle, secretary; Kansas City Motor Car Dealers' Association, Albert T. Clark, president, and E. E. Peake, secretary; Omaha Automobile Trade Association, represented by its neighboring Kansas City association; Chicago Automobile Trade Association, Edwin B. Bodley, attorney; Grand Rapids Automobile Business Association, Ernest T. Conlon, secretary; Columbus Automobile Trade Association; Harry J. Schwartz, director; Indianapolis Automobile Trade Association, E. W. Steinhart, vice-president; Scott County—Davenport, Iowa—Automobile Trade Associaton, Gardner Smth, secretary; Washington Automobile Trade Association, S. L. Grogan, secretary; San Francisco and the Pacific Coast, William Hughson.

Undecided on Owner Tax

WASHINGTON, D. C., May 29—Special telegram—Senator Ollie M. James, of the Senate finance committee, stated in answer to a query as to what extent car owners would be taxed under the Senate bill, that no decision had been reached on this question and none probably would before next week. Senator James said it had been definitely decided to eliminate the 5 per cent and that the committee, in seeking to adjust this tax, would seek to bring in approximately as much money from a tax on owners as the house bill had expected to raise from the manufacturers.

Senator James stated further, however, that the committee had referred this matter back to the Secretary of he Treasury for an estimate of the amount which the Secretary thinks should be raised in this way, and that action by the committee would await the Secretary's recommendations. The original recommendation of Secretary McAdoo was that the motor car tax be assessed directly against the owner.

ENGLAND BANS RUBBER IMPORTS

New York, May 25—England has declared an embargo on the importation of rubber goods into that country except under the license of the board of trade. From now on, only Government tires will be allowed in.

Shipments to Scandinavian countries, formerly by way of London, are now through Halifax. Licenses, however, must still be secured in London, as before.

Cabinet Officers Sound Call to War

Emphasize Urgency of the Country's Needs Before Editorial Conference of Business Papers

WASHINGTON, D. C., May 26—The coordination of every resource and every effort of every American toward the prosecution of the war if it is to be successful is the message to the reading public brought by the members of the President's cabinet and the Council of National Defense to the editors of 200 class, trade and technical publications yesterday. This message was the burden of the talks of cabinet members and others highest in government councils before the Editorial Conference of Business Papers, arranged by the Associated Business Papers editors to learn first hand how they could best serve their country. The object of the conference as given on the program is:

"To promote the more effective use of the business energies of the country by a closer coöperation of the business press with the government."

Franklin K. Lane, Secretary of the Interior, emphasized the fact that America is not fighting for an idea only but for something more vital—it is fighting for this country to prolong its life as a people's government.

A Conflict of Smokestacks

Secretary of War Newton D. Baker in a stirring talk said that this is a conflict of smokestacks, a war of flywheels—that the problem is to organize and equip the army without disorganizing industry.

Secretary of the Navy Josephus Daniels outlined the "Needs of the Navy" and made the point that the navy needs ideas—it needs every effort of inventors, scientists and engineers. America has taken the offensive in the war—not the defensive—and the slogan of the navy is the words of Admiral Farragut: "Damn the Torpedoes—Go Ahead."

Secretary of Commerce William C. Redfield, after telling what his department is and has been doing in the development and popularization of new foods, mentioned the fact that there were many things the government cannot take the public into its confidence on for reasons of public safety but that "Silence usually is an indication of action in a time like this."

Secretary of Labor William B. Wilson emphasized the national shortage of farm labor for the approaching harvest and urged a nation-wide drive on the harvest—an extension of the old barn-raising idea.

The Department of Agriculture was represented by Doctor Pearson, president Iowa State Agricultural College, who told of the value of farm tractors in assisting the nation in meeting the needs for increased food supplies and stated that tractors are being operated in Kansas in 24-hr. shifts continuously, carrying searchlights for night work, and that the department had placed tractor experts at convenient points so that in case of tractors breaking down there could be men on hand in a few hours.

Probabilities of the control of operation of passenger cars for pleasure purposes on account of fuel shortage and the need of adequate supplies for military work was brought out by Van H. Manning, director U. S. Bureau of Mines and a member of the Council of National Defense.

Food Administrator Herbert Clarke Hoover, the man who probably will be in control of the food of the nation under the necessities bill, was very emphatic that this is to be a war of attrition—its end will come and come only when we can starve our enemies to the point where they must give in. That means a long war—two or perhaps five years more.

Frank Scott, chairman munitions board, Council of National Defense, gave the keynote of his message when he stated that modern war is a war of the four Ms—Men, Metal, Machinery and Money.

Franklin H. Martin, in charge of Red Cross work, medicine and sanitation, Council of National Defense, brought out the fact that the mortality on the European front was higher among Red Cross workers than any other arm of the service, aviators and front-line trench fighters not excepted. He told of the wonderful work the motor ambulances are doing.

Coöperation among the railroads to expedite government shipment for both our own use and that of our allies was outlined by Howard Elliott of the railroad war board of the Council of National Defense.

Our Metal Resources

Our metal resources were dealt with by George Otis Smith, director of the U. S. Geological Survey, who made the encouraging statement that new discoveries of ore and better methods of refining were keeping pace with the increasing demand to a much greater extent than might have been anticipated.

Special plea for the popular subscription to the Liberty Loan bonds rather than having it taken up by financial interests was made by Lewis B. Franklin of the Treasury Department, for the moral effect on allies and enemies, who emphasizes the fact that of this money loaned to our allies every cent comes back—is spent in this country.

Francis S. Peabody, chairman of the committee on coal production of the Council, told how the coal men are pooling their shipments to conserve transportation. Chairman George Creel of the committee on public information, popularly known as the censorship board, promised most complete coöperation with the business press and put it on its honor in the matter of state secrets.

The government is organizing for new business, the business of war, and our success will be measured by the degree of our organization. Americans must learn to economize—not necessarily by buying less but by cutting out waste—was the message of Frank A. Vanderlip, president National City Bank of New York, to the country through the editors.

WOMAN MOTOR LABOR INCREASES

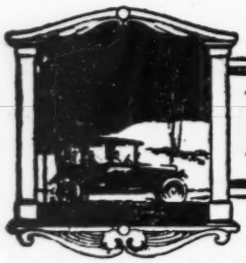
Milwaukee, Wis., May 26—The employment of women in places that always have been occupied by men is growing in Wisconsin, and the motor car industry is taking part in the pioneering work that must be done to provide for the possible contingency of a shortage of labor growing out of the war.

A special report on women labor in workshops has just been issued by the Industrial Commission of Wisconsin. It says that the Nash Motors Co., Kenosha, Wis., already has started to place women in its core-room. In Milwaukee, the Cutler-Hammer Mfg. Co., Geuder, Paeschke & Frey Co., and other large concerns closely identified with the motor car, parts and equipment industry not only are employing women in the shops in places usually filled by men, but they are advertising in the newspapers for more women for such purposes. The Allis-Chalmers Mfg. Co., Milwaukee, now employs a large number of women on mica-winding and other electrical construction of a light nature.

It is stated that the reduction of the output of confections, due to economizing by consumers, has released hundreds of girls and women to other industries. There are no restrictions regarding employment of women in Wisconsin, excepting those prohibiting their employment in mines and quarries.

ALTER COMPANY BANKRUPT

Plymouth, Mich., May 28—The Alter Motor Car Co. was judged bankrupt by Judge Arthur J. Tuttle, last Friday, and the disbursement of the company's assets was referred to Lee E. Joslyn, referee in bankruptcy. Creditors of the defunct company are the Remy Electric Co. of Indiana, Carr Fastener Co. of Massachusetts, and the General Spring & Wire Co., of Michigan.



EDITORIAL PERSPECTIVES

Will Federal Replace State Licences?

THE proposed establishment of a federal licensing arrangement may prove to be a stepping stone to one of the things for which organized motordom has been striving for many years. The national emergency may call into permanent establishment a federal license, which after the war, or perhaps earlier, may supersede the state and municipal taxes. Federal licenses in lieu of state registration is a consummation for which all motorists have been hoping. It is within the bounds of probability that after the war this may come about. It may even come before then.

The Motorist's Service

THAT motorists who are not called to the colors either in military or civilian service for the government in the war will have the opportunity to do their bit in a way as essential, if not as spectacular as if they were fighting at the front seems to be certain. Motorists are going to be called upon to do a large share in furnishing the sinews of war in the drain upon their pocketbooks, in the operation of their cars, unless all signs fail.

IF, as seems most probable at this writing, the House recommendation of a 5 per cent tax on cars and tires at the source is superseded in the general tax bill by the recommendation of the Senate that the tax be placed upon owners as a direct federal license fee based upon horsepower, weight, carrying capacity or some combination of these the motorist will have to make a direct contribution to the cause as a motorist. This, in all probability, will be in addition to contributions to state and city funds which he has been making through state license fees and city wheel taxes.

OTHER direct contributions which he may be called upon to make, probably will include taxes on tires and on gasoline—either by a direct tax or through higher prices, some of which will go to the government for the carrying on of the war. If the necessities bill becomes a law the motorist may be restricted as to the amount of fuel he may use per week for pleasure purposes.

Status of Liberty Loan

MOTORISTS of America should need little explanation to enable them to recognize the Liberty Loan as an opportunity to get in on the ground floor. Its patriotic purpose does not lessen its desirability as an investment. The loan as an investment for small holders has not received a very great amount of publicity. The chief effort so far has been through appeal to the patriotism of the people.

THE government does not ask the American public to risk its savings—on the contrary it offers a tax-free investment at an interest rate better than that of a savings bank, an investment whose value, in the opinion of financial experts, is certain to increase steadily as the bonds approach maturity. This is not an appeal to the mercenary instincts of motorists, but is only put forward to emphasize the fact that to do your bit in the purchase of Liberty bonds does not entail financial loss.

NO OTHER investment is more sure. When you buy a Liberty bond you not only pay a tribute to the flag but obtain for yourself the safest investment in the world, for Uncle Sam is behind this bond issue and he is worth $225,000,000.

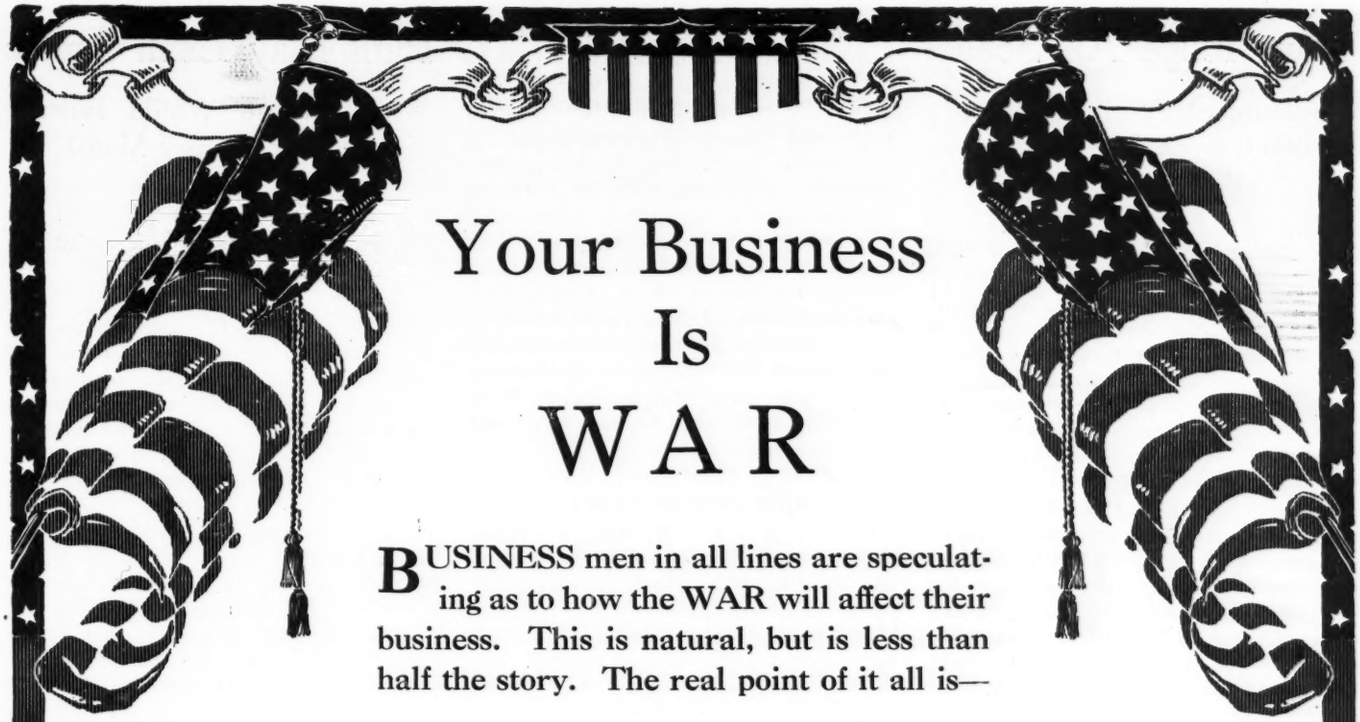
READ what the Secretary of the Treasury, William G. McAdoo, had to say on the war and the war loan May 14 of this year. He said:

"Wars cannot be conducted without money. It is the first thing to be provided. In this war it is the most immediate help that we can give. We must not be content with a subscription of two billion dollars—we must oversubscribe this loan as an indication that America is stirred to the depths and aroused to the summit of her greatness in the cause of freedom. Let us not endanger success by complacent optimism. Let us not satisfy ourselves with the reflection that someone elese will subscribe the required amount. Let every man and woman in the land make it his or her business to subscribe to the Liberty loan immediately, and if they cannot subscribe themselves, let them induce somebody else to subscribe. Provide the Government with the funds indispensably needed for the conduct of the war and give notice to the enemies of the United States that we have billions to sacrifice in the cause of Liberty.

"Buy a Liberty bond to-day; do not put it off until to-morrow. Every dollar provided quickly and expended wisely will shorten the war and save human life."

Help Win the War—Buy a Bond

See Page 18 of this issue



Your Business Is WAR

BUSINESS men in all lines are speculating as to how the WAR will affect their business. This is natural, but is less than half the story. The real point of it all is—

How Will Your Business Affect the War?

HOW can your business be arranged to conserve men, money and material for your country's need in WAR? Last Friday members of the President's Cabinet and the Council of National Defense—seventeen of the biggest men of the Republic charged most directly with the successful prosecution of the WAR and more closely in touch than any other men in America with the real *inside facts* of the country's aims and needs—told 115 editors, representing the business and trade press of the United States, what these papers can do in aiding their country. Though presented in seventeen different ways, the message of these seventeen men was the same—*"Give your readers this message:*

"You Are at War"

—every other consideration must be subordinated. Americans do not realize it yet, but *they will.* The more quickly Americans wake up to what modern WAR means, the more quickly the WAR will end.

Next Week

War Is Spelled With Three M's—Men—Money—Materials

Plans Huge Air School

Government Will Spend $1,000,000 on Joy Aviation Field Equipment

To Test Airplanes and Seaplanes on Grounds

DETROIT, May 26—The Joy aviation field near Mount Clemens, Mich., which has just been purchased by the government from H. B. Joy, has witnessed considerable activity during the last few days. Plans are being arranged to expend the $1,000,000 which the government has appropriated to fit this land for aviation work. The plans for the numerous structures were made by Albert Kahn, architect, of Detroit, the war department, for the first time in its history, employing an outside architect. This aviation school is one of nine which the government will build in various parts of the country. Mr. Kahn's plans are standard. He was recently made architect of the aviation section of the signal corps of the United States army.

Airplanes and seaplanes will be tested on these grounds. Even a church will be located on the property. The government has purchased 1700 acres for the village, which will have approximately 1000 inhabitants at the start.

MAY GET WAR ORDERS

Grand Rapids, Mich., May 28—It is possible that two or three motor truck manufacturing companies in this city will get orders for motor trucks for the United States war department service. George F. Sweet, manager of the United Motors Co., the largest truck maker in Grand Rapids, is now in Washington consulting with government officials about the kind of truck needed. It is altogether probable that the largest order taken in Grand Rapids will be extended to the United Motors Co. This company now has its trucks in the service of England and France and has numerous orders from those countries, which it will not be able to fill for some time. The company recently started the manufacture of a motor tractor which the government may find suited to military purposes. The Michigan Hearse & Motor Co. also has been asked to bid on light 1-ton trucks. The company makes hearses and ambulances but it is said the company could turn out at least 200 1-ton trucks by Jan. 1, to fill a government order.

3500 PLANES THIS YEAR

Washington, D. C., May 26—With Howard E. Coffin in charge of the newly organized aircraft production board, created by the Council of National Defense, plans are being organized to produce planes and aviators. It is estimated that 3500 planes and 6000 aviators will be available before the end of the year. Next year the program of aircraft production is to be even larger, and this, of course, means that the demand for airmen will increase proportionately. Associated with Mr. Coffin on the board are S. D. Waldon, former vice-president of the Packard Motor Car Co.; George O. Squier, chief signal officer U.S.A.; Rear-Admiral D. W. Taylor, chief of the Bureau of Construction, U.S.N.; E. A. Deeds of the Dayton Engineering Laboratories Co; and R. L. Montgomery of Montgomery, Clothier & Taylor, Philadelphia, who will serve as financial advisor of the board.

MECHANICS FOR OVERSEAS DUTY

Detroit, May 26—The Cadillac Motor Car Co., Packard Motor Car Co., Hudson Motor Car Co., Ford Motor Co., Studebaker Corp., Chalmers Motor Co., Continental Motors Corp. and the Northway Motors Co. each will select certain mechanics from their organization to complete the plan of the United States government to send expert mechanics for a course of extensive training in the airplane factories of France. The Cadillac Motor Car Co. also has been requested to furnish two combination chauffeurs and mechanics to drive cars for the marine corps in France. The two drivers will be enrolled for the term of the war with the rank of sergeant. They will receive $38 a month with $15 for extras and 20 per cent additional for foreign service. Their board, and clothes and transportation will be furnished by the government. The mechanics going to the airplane factories will receive $4 a day and transportation and will retain a civilian status.

RICKENBACHER GOES TO CAPITAL

Detroit, May 26—Eddie Rickenbacher has been called to Washington for consultation regarding the starting of aviation practice work by the racing drivers' aviation corps which was formed through the efforts of Rickenbacher.

MACKIE REPORTS FOR DUTY

Waukesha, Wis., May 26 — Mitchell Mackie, sales manager of the Waukesha Motor Co., Waukesha, Wis., who recently was commissioned a captain in the quartermaster officers' reserve corps, in charge of motor transport for the army, was ordered to report at Fort Sam Houston, Tex., and has left for the South.

MARMON GETS COMMISSION

Indianapolis, Ind., May 28—Howard C. Marmon, president of Nordyke & Marmon, manufacturers of the Marmon 34, has been called to Washington to take complete charge of the development of engines for the army airplane service. Mr. Marmon has accepted the call of the government and has been given the rank of captain.

Paris May Limit Traffic

War Measure Would Restrict All Unnecessary Motor Travel

Protest Cites Previous Requisitions of Cars

PARIS, May 1—All motor traffic not necessary for national defense will be forbidden in France, if the recommendation of the official gasoline saving committee is carried into effect. This committee has been appointed by the Government to deal with the whole question of gasoline, kerosene and oil supplies throughout France. A few exceptions are provided for in the proposed restrictive scheme which has been sent up to the government for signature. It is intended to leave in use a certain number of taxicabs, motor omibuses, senators' cars, and cars belonging to members of the diplomatic corps.

This is the first time since the outbreak of the war that restrictive maesures have been proposed against motor cars in France. Gasoline has increased in price, but this is due entirely to higher freight and insurance. Louis Renault, president of the car manufacturers' syndicate, is heading a protest against the proposed restriction. He points out that private car traffic has been reduced to a minimum by reason of the requisition of cars and the mobilization of drivers.

EXPORT GAS PRICES UP

New York, May 25—Prices on gasoline for export have been advanced 2 cents a gallon by the principal refining interests. Gasoline for foreign shipment is now quoting at 36¼ cents a gallon for the 68-72 grade in ten to ninety-nine cases, there being 9½ gal. to a case. In 100 to 199 case lots, the price per gallon is 36 cents, and in 200 to 299 case lots, the price is 35⅝ cents. The 72-76 grade per gallon in the ten-ninety-nine case lot, is 40¼ cents. The other two lots are 40 and 39¾ cents respectively.

This is the first change that has been made in quotations of any of the refined products for several months and is attributed to the continued heavy foreign demand in conjunction with the growing acuteness of the situation with reference to supplies. Another important reason for the rise is the present shortage of labor.

CHICAGO RECRUITS CHAUFFEURS

Chicago, May 28 — Since recruiting of truck drivers and mechanics began in the Quartermaster's Department three weeks ago, six companies have been organized and the seventh is more than half completed. According to Captain Webster there have been six companies of thirty-five men each and twenty men of the seventh company recruited to date. Each

company consists of thirty-two sergeant chauffeurs, among whom are one truck master and three assistants, two mechanics and a cook. Trucks that have been in use on the border are arriving at the various training camps, one trainload having been checked in at Fort Sheridan last Saturday. With each fleet of trucks coming up from the border are twelve or thirteen men who have seen service, and they will be distributed through the various new companies recruited so that there will be experienced men with each crew.

BOSTON TRADE SELLS BONDS

Boston, Mass., May 26—The Boston automobile trade comprising the dealers, tire, garage and accessory forces, held a meeting yesterday and picked out June 4 as Liberty Bond Day. On that day a concerted effort will be made to sell the bonds to the different forces. Some of the dealers have done their selling already, John H. Johnson of the Buick called a meeting of his forces Monday and he sold bonds to every one of the eighty-five employees on his staff.

ASKS EIGHT MOTOR COMPANIES

Detroit, May 26—Detroit has been asked by the central department at Chicago to furnish eight companies for the motor truck section of the quartermaster's reserve corps. This means the raising of a regiment made up of truck drivers and mechanicians. Captain William E. Dunn of the United States field artillery will superintend the work.

COLES FOR LIBERTY BONDS

Indianapolis, Ind., May 26—The Cole Motor Car Co. has taken a new step in opening avenues for negotiating the Liberty Loan by offering to accept such bonds in partial or complete payment for its customers' purchases. The plan provides for the acceptance of Liberty bonds at $102 for each $100 bond. The bonds may be redeemed by the customers later.

WILLYS' BOAT TO U. S.

Toledo, Ohio, May 28—John N. Willys, president of the Willys-Overland Co., has notified the Bath Iron Works at Bath, Me., to discontinue the fitting out of his yacht which he is having built at a cost of more than $500,000. Mr. Willys will have the vessel turned over to the government for war work. It resembles a torpedo boat destroyer and will make 30 knots an hour.

MAKES TRUCK ENGINES ONLY

Muskegon, Mich., May 28—The plant of the Continental Motors Corp. at Muskegon, is to be given over entirely to the production of truck engines. It is stated that the company has received a very large order from the United States government, and that for this reason the manufacturing of motors for passenger cars will be taken care of exclusively at the Detroit branch.

Mexico Truck Use Grows

Carloads of Vehicles Have Been Imported During Last Few Weeks

Burro Is Being Transplanted by Motor Transportation

LAREDO, Tex., May 25—An unexpected and rapidly growing demand for motor trucks is coming from Mexico, and many carloads of these vehicles have entered that country through the El Paso, Eagle Pass and Laredo ports of entry during the last three or four weeks. The shipments are increasing constantly, the demand coming chiefly from the larger mining companies that are reopening their respective properties. Most of the orders for motor trucks for Mexico shipment are placed with dealers in cities and towns on or adjacent to the Rio Grande, particularly San Antonio and El Paso. Recently a mining company that operates a large property in the State of Chihuahua placed an order for eight Jordans and the vehicles were shipped promptly.

It is stated by the American representatives of different truck manufacturing companies who have been on trade trips into Mexico during the last few weeks that everything points to a very heavy business in this line in that country as soon as normal conditions are restored there. The larger foreign-owned mining companies plan to utilize trucks instead of the slow-moving burro wherever the roads are good enough to afford the operation of the motor vehicles. It is interesting to note that the motor truck has had its development chiefly during the last six years that mining operations in Mexico have been suspended. In the oil-producing territory around Tampico many American companies are installing motor trucks for the transportation of supplies and lighter machinery to the different camps.

ELECTRIC INTERESTS MEET

Hot Springs, W. Va., May 25—About forty representatives of the eleven company members attended the first annual meeting of the Automotive Electric Association in this city. O. F. Conklin, Remy Electric Co., chairman of the standardization committee, made his report, appointing various sub-committees to handle subjects of importance to the industry. A sub-committee has been appointed to handle the work in connection with supplying the government with electrical equipment for use on trucks and airplanes.

Efforts were made at the meeting to arrange some manner in which the patent situation pertaining to the industry could be adjusted amicably to the best interests of the members and their customers.

This association was formed last April and is composed of manufacturers of all automotive electric accessories, as follows: Dayton Engineering Laboratories Co., Dayton, Ohio; Dyneto Electric Corp., Syracuse, N. Y.; Electric Auto Lite Co., Toledo, Ohio; The Leece-Neville Co., Cleveland, Ohio; North East Electric Co., Rochester, N. Y.; Remy Electric Co., Anderson, Ind.; The Robbins & Myers Co., Springfield, Ohio; Splitdorf Electric Co., Newark, N. J.; U. S. Light & Heat Co., Niagara Falls, N. Y.; Wagner Electric & Mfg. Co., St. Louis, Mo.; and Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.

The officers are: President, G. B. Griffin, Pittsburg; vice-president, C. O. Mininger, Toledo; secretary, G. S. Cole, Cleveland; and treasurer, C. L. Amos, Syracuse.

TRIES OUT AIRPLANE ENGINE

Cincinnati, Ohio, May 28—Ralph de Palma, who owns the Packard airplane engine racing car, is experimenting with this engine while training for the speedway races here. De Palma is determining what improvements are necessary and is keeping the Packard company and the government advised.

TO MAKE GIANT AIR ENGINE

Buffalo, N. Y., May 26—G. C. Goode, English aviator, is supervising manufacture of a 350-hp. airplane engine at the Sterling Engine works. This company has purchased the American rights for the Sunbeam airplane engine twelve-cylinder 350-hp. and eighteen-cylinder 500-hp. engine and has taken over contracts for them. The contracts demand that operation of manufacture start by June 1. The new engine which Mr. Goode is working upon will weigh 1075 lb. and drive a bomber weighing 2200 lb. at a speed of 130 m.p.h. at an altitude of 14,000 ft. Mr. Goode states that present-day air fighting in Europe is done in an average altitude of 9000 ft.

LOCATE IN RELIANCE PLANT

Lansing, Mich., May 26—The Tractor Producing Co. and the Deusenberg Motors Corp. have located temporarily in the plant of the Reliance Engineering Co. The Tractor Producing Co. makes four-wheel drive trucks and four-wheel drive tractors. But one type of each is being made, the tractor being confined to 30 hp. and the motor truck to the three-ten type. The company has confined its business exclusively to Russia and France since the war started. The Deusenberg Motors Corp. builds engines for sub chasers, airplanes and tractors, and is affiliated locally in production with the tractor company, which takes a certain per cent of the engines made by the Deusenberg corporation.

LAWSON AIRCRAFT GETS PLANT

Green Bay, Wis., May 28—The Lawson Aircraft Co., recently organized by Alfred W. Lawson, has obtained its first factory and has refitted it for airplane construction.

The building contanis 8000 sq. ft. of floor space and is expected to be ready for operation within three months. Besides this the company has taken over the use of two machine shops at Green Bay and two woodworking shops. The shops will have capacity for the employment of 1000 workmen altogether.

John Carisi, Brooklyn, N. Y., has been made factory superintendent. Lawrence Allison, formerly with the Curtiss, the Standard and the Burgess companies, is chief engineer, while Lee Wallace, who has had ten years' experience with airplanes, first with the Christoferson company in California and later with the Curtiss, is designer. Rudy Sanders, formerly with the Standard, is assistant designer.

NEW TRACTORS AT $350

Tacoma, Wash., May 25—Henry Korevaar, a farmer, has designed a tractor specially for use on the Pacific coast, where the excessive rains render many types of tractors useless. The tractor is supplied by an 8-hp. gasoline engine, will plow a 17-in. furrow 8 to 9 in. deep and has a harrow attachment behind. Its weight is about 1400 lb. and it can be manufactured for $350.

AUTOMOTIVE ELECTRIC BODY

New York, May 28—The recently organized Automotive Electric Association, which is an organization of concerns manufacturing starting and lighting apparatus, has organized itself for committee work, having taken this step at a meeting held in Pittsburgh. The organization has a large committee on standardization which is expected to co-operate with the Society of Automotive Engineers in this work. There are other committees on electrical equipment for airplanes and also electrical equipment for government trucks.

It is not known exactly what is going to be the complete scope of this organization with regard to the industry, but unquestionably it will have in mind the good of its membership in all matters. This organization is somewhat similar to one of the rim manufacturers. There have been one or two other organizations within the industry of a similar nature.

The following is the committee orgnaization:

STANDARDIZATION COMMITTEE TO CO-OPERATE WITH S. A. E.
O. F. Conklin, Remy Electric Co., chairman.
W. A. Chryst, Dayton Eng. Lab. Co.
A. E. Doman, Dyneto Electric Co.
B. M. Leece, Leece-Neville Co.
C. F. Gilchrist, Elec. Auto-Lite Co.
C. E. Wilson, Westinghouse E. & M. Co.
T. L. Lee, North East Elec. Co.
H. R. Stuart, Robbins & Myers Co.
A. H. Timmerman, Wagner Elec. Mfg. Co.
A. D. T. Libby, Splitdorf Electric Co.

SUB-COMMITTEE ON ELECTRICAL EQUIPMENT FOR AIRPLANES—RESEARCH
W. A. Chyrst, chairman.
B. M. Leece.
A. D. T. Libby.
C. E. WILSON.

SUB-COMMITTEE ON GOVERNMENT TRUCK EQUIPMENT—ADVISORY
T. L. Lee, chairman.
C. E. Wilson.
Harve R. Stuart.
A. D. T. Libbey.

Pike Boosters End Tour

Colorado Springs Chamber of Commerce Party Motors Through 4 States

1900-Mile Sociability Run Started in Blizzard

COLORADO SPRINGS, Colo., May 26—It is seldom that such an extensive tour as that the Colorado Springs chamber of commerce just ended is begun under less favorable prospects, for two days before the start there was a foot of snow at Colorado Springs and the seven cars of khaki-clad enthusiasts started in a blizzard on their 1900-mile trip through Colorado, Kansas, Oklahoma and Missouri.

The sociability run was held to initiate the Albert Pike highway projected from Hot Springs, Ark., to the Pike's Peak region by Tulsa, Okla. The exact routing has not been determined, and many towns not on the itinerary of the Colorado Springs party sent delegations to urge inspection of their roads and scenery. Some towns of 800 inhabitants sent fifty business men 40 miles. The tour lasted eleven days and was the most successful of the similar events conducted in the last four years under the auspices of the Colorado Springs chamber of commerce. Every car made the complete circle trip, and there were no accidents or serious breakdowns.

The tourists followed the Santa Fe trail to Dodge City, Kan., where they were met by Vice-President C. H. McCollom of the Albert Pike Highway Association and piloted by him to the Oklahoma state line, where President Avery and Secretary E. B. Guthrie of the new highway met them. The route then was through Oklahoma, Enid, Guthrie, Oklahoma City, Okemah, Tulsa, Muskogee and Vinita, back to Joplin, Mo., and westward over the Oil Belt route through Pittsburg, Independence and Arkansas City to Wichita, Kan. The Meridian road was followed north through McPherson to Salina, the Golden Belt road through Russell, Ellis and Oakley to Colby, and the Pike's Peak Ocean-to-Ocean highway through Goodland, Limon and Calhan to Colorado Springs.

Only one stream had to be forded. This was between Pryor and Vinita, Okla. The cost of the tour was about $5,000. Two Cadillacs, two Studebakers, a Packard, Hudson and Chandler were used. The average speed was about 30 m.p.h., and a system of red flags indicated turns and dangerous spots.

REORGANIZE F. R. P. COMPANY

New York, May 25—A reorganization, together with an increase of capital, of the Finley Robertson Porter Co., Inc., Port Jefferson, L. I., has been completed. This widening of the activities of the company means a larger production and the introduction of additional capital to make such possible. The capital has been increased from $100,000 to $250,000 preferred stock of par value 100, carrying 8 per cent cumulative, and 10,000 shares common of no par value.

Under the broadened plans of the company production has already been started on a run of 100 F.R.P. cars. The price for the seven-passenger touring car has been increased from $6,000 to $7,000. The new cars are different from the old models in that sixteen-valve engines are used. The general engine design is the same as formerly with the exception of the sixteen-valve arrangement. Cylinder sizes are 4⅜ by 6¾ and the wheelbase is 140 in.

Finley R. Porter, who has been the directing spirit of the company since its organization, is president under the reorganization scheme. F. D. Veiller is vice-president, and R. C. Kay of Pittsburgh, is secretary and treasurer. These men, with Paul R. Towne, of Harris & Towne, attorneys, and J. S. Stubbs, comprise the board of directors.

BROWN SPRING OILER LICENSE

Cleveland, Ohio, May 25—The Brown Spring Oiler Co. has licensed the Babbitt Spring Oiler Co., the National Motor Supply Co. and the Lazarus Mfg. Co. to manufacture under one of its patents on spring leak lubricators.

STRAITS PROHIBIT IMPORTS

Washington, D. C., May 25—The Straits Settlements has prohibited the importation of motor vehicles. In the federated Malay States a 10 per cent ad valorem duty on motor cars has been established, according to a message from the American Consul General at Singapore.

G. M. STOCK TRANSFER APPROVED

New York, May 25—The transfer of the assets and business of the General Motors Co. of New Jersey to the General Motors Corp. of Delaware has been approved by the stockholders, and they have decided to retire the $14,985,200 outstanding preferred stock of the company. The authorized preferred stock amounted to $20,000,000.

The Delaware corporation has a total authorized capital stock amounting to $102,600,000. Holders of the old preferred receive one and one-half shares of 6 per cent preferred in the General Motors Corp. for each share of 7 per cent stock owned. The old preferred to be retired is the stock which will not be exchanged for the new preferred.

SIX CLYDESDALE TRUCK MODELS

New York, May 25—Six models, including 5-, 3½-, 2-, 1½-, 1- and ¾-tonners, will be produced by the Clyde Cars Co., which has been organized through the merger of the Krebs Commercial Car Co.,

the Clyde Cars Co., Clyde, Ohio, and the Lincoln Motor Truck Co., Detroit. These will be known as the Clydesdale trucks.

The design was made by European engineers to conform as closely as possible to the requirements of French and English war office specifications, with the use of American components. The company has been doing a large business with the English and French governments in its 2 and 1½-ton models.

The capital has been increased to $500,000 by the merger. The officers are: President, C. R. Dunbar, Holyoke, Mass.; vice-president and general manager, J. C. L. Krebs; assistant treasurer and sales manager, W. P. Dodge; treasurer, J. B. Crockett, New York; and secretary, Homer Metzger.

CHALMERS SETS LOW GEAR MARK

Minneapolis, Minn., May 26—Among the low-gear tests of the Chalmers cars being made by dealers in various parts of the country the Chalmers Motor Co. of Minnesota staged the first 24-hr. low gear run to be sanctioned by the A.A.A. Second and high gears were removed, and the run was made without a motor stop or mechanical trouble in Minneapolis, St. Paul and the surrounding country. L. A. Hillman, representative of the A.A.A. in Chicago, had charge of the test. The report shows the engine did not at any time become dangerously warm and that the oiling system took care of the high speed of the engine. The average speed for the 257.6 miles covered was 10.73 m.p.h. Three quarts of oil were used. Gasoline amounted to 35 gal., and average mileage of 7.36 to the gallon. Four gallons of water were consumed. The car used was a five-passenger stock Chalmers. The tire equipment was United States Royal Cords, 32 by 4, straight sides, mounted on wood wheels. The test was the fourth of a series conducted by W. F. Sturm, Chalmer contest manager.

BAGBY M. & A. M. CREDIT MANAGER

New York, May 25—A. C. Bagby has become credit manager of the recently formed credit department of the Motor and Accessory Manufacturers. Mr. Bagby is credit manager of the Hess-Bright Mfg. Co., Philadelphia. He will be in charge of the work of enlarging and extending the credit service of the association.

STEAMOTOR TRUCK PERSONNEL

Detroit, May 26—The Steamotor Truck Co., organization of which was announced last week, will include in its corporation the following individuals: Harry T. Weeks, Chicago; W. O. Duntley, president Chicago Pneumatic Tool Co., Chicago; John T. Connery, president Miami Coal Co., Chicago; Fred S. Richmond, president Fred S. Richmond Machine Co., Salt Lake City, Utah; Robert M. Eastman, president W. F. Hall Printing Co, Chicago, Adelor J. Petit and Abner Doble, vice-president.

Ford Needs Much Cash

Daily Running Expense Between $800,000 and $900,000, Says Treasurer

Thirty-Day Halt Would Mean Closing of Doors Indefinitely

DETROIT, May 28—The Ford Motor Co. requires between $800,000 and $900,000 daily for running expenses. Assets are consumed so ravenously by the operations of the factory that if production were halted for thirty days the Ford company would be forced to close its doors. These were statements made by Frank L. Klingensmith, vice-president and treasurer of the Ford Motor Co. during the hearing of the Dodge-Ford suit Saturday.

With this testimony the Ford company sought to emphasize the point that the River Rouge smelter plant contemplated by Henry Ford and objected to by the Dodge brothers, is necessary to manufacture iron directly from ore for the Ford products.

Mr. Klingensmith also stated that at the last meeting of the board of directors of the Ford company held May 1, 1917, a 50 per cent dividend was declared in opposition to James Couzens who desired a 100 per cent dividend.

Horace H. Rackham, a director of the Ford Motor Co., stated that he did not believe in expanding the company's business without limit but that the limit is so far away that he did not believe that any one could fix it at this time. Under examinaion, Mr. Rackham admitted that he was not a practical man and that he had little knowledge of the details of the Ford company's organization.

C. Harold Wills, chief engineer of the Ford Co., testified his belief in the necessity for expansion.

"I cannot see how we can meet next year's business," he said, "unless some of our building plans are carried forward immediately."

It was shown by the records of the directors' meeting Feb. 2, 1916, that the Ford Motor Co. sold its claims in the tractor business to Henry Ford personally for $46,810. The company reserved the right, however, to go into the tractor business whenever it pleased and to use the name "Ford" although it did not interfere with Mr. Ford's using "Henry Ford."

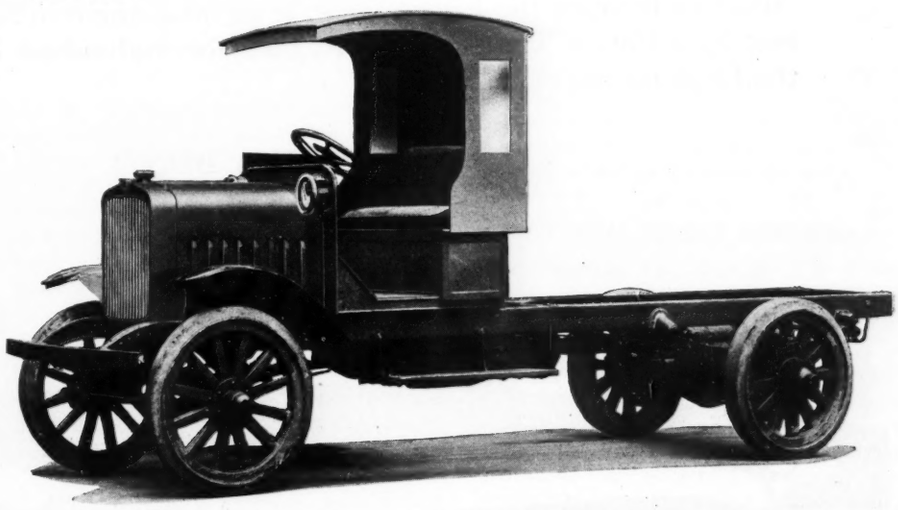
Mr. Wills declared that Henry Ford had talked about producing 100,000 trucks this year and that materials for 10,000 of them had been ordered four months ago. He also testified that there has never been enough room at the Ford plant to supply the demand and that the company could have sold 100,000 trucks and 100,000 closed cars last year if it had had them. Testimony developed that the last reduction in price cut the profits in half; but the company had made a profit of $60,000,000 on 500,000 cars in 1915 and $30,000,000 on 750,000 cars in 1916. He discussed the value of three working shifts a day and said he wanted to eliminate the midnight to 8 a. m. shift because he was impressed by the number of men who complained, by the number of wives who complained and by the general inefficiency demonstrated in those hours. The case has been continued to June 4.

FORD TRUCK IN JULY

Detroit, May 28—Ford trucks will be in production and will be turned out at the rate of twenty-five a day in July. As stated in MOTOR AGE for April 19, this truck will be provided with an overhead worm-drive axle operating with the powerplant now employed for the Ford passenger car and through a planetary gearset.

BROSSEAU HEADS INTERNATIONAL

New York, May 29—Special telegram—A. J. Brosseau, vice-president Federal Motor Truck Co., Detroit, will June 1 become president of the International Motors Co., succeeding Vernon Munroe, who will go to California for a rest.



Chassis of 2-ton Steamotor truck with Doble steam car plant

HELP Win the War

AMERICA looks to *her people* for the sinews of this war. The billions to be raised by the Liberty bond issue could have been obtained direct from the large financial institutions. However, the mere raising of the money is not the sole purpose of the bond issue. *America must show her allies and her enemies that the American people are behind her government in this.*

NATION-WIDE POPULAR response to the nation's call for war funds by popular subscription to the bonds will show the world that the great masses of the people are backing the war. This will hearten our allies and give the lie to the contention of our enemies that the hearts of our people are not in the conflict. You who can and do not buy Liberty bonds some day will arraign yourselves as guilty of *giving aid and comfort to the enemy.*

WHAT IS THE REAL SIGNIFICANCE OF THE LIBERTY LOAN?

THE title of the new war finance plan is no mere alliteration, no sounding catch phrase. It is in reality a "liberty loan," for it represents the efforts of the United States to insure human liberty. Every dollar given to America through the Liberty loan is an investment in Security against Domination by a Power That Has No Regard for Individual Rights—that Exists for the Exploitation of Humanity.

BUY A BOND

Overland's Gotham Building Unique

New York Structure Designed to Give Car Owners Quick Service at Reasonable Cost

New ten-story service building just opened by Overland in New York

QUICK service! Reasonable charges! These two requisites to satisfying the motor clientele of any company are embodied in and made possible by, the new service building just completed by the Overland company in New York. Briefly, the building and its arrangement is this:

Built of concrete and steel, ten stories high, each floor having dimensions of 150 by 200 ft., the structure contains a total of 300,000 sq. ft. of floor space, or more than many of the motor car factories. It is located on Fifty-seventh street about a half mile from the heart of the motor car section and is reached by a company-operated bus. Two elevators and ramps to the first four floors provide easy and quick access. There also are two passenger elevators and four dumbwaiters for the quick delivery of parts.

The first floor forms the receiving room; second floor, minor repairs; third and fourth, specialized repairs, that is, mechanics doing special work only are found on these floors; fifth, body shop; sixth, parts and accessories; seventh, preparation room for new cars to be delivered; eighth and ninth, new car storage; tenth, general offices and wholesale showroom.

On the third and fourth floors are found improvements that speak of progress. For example, on the third floor used cars taken in trade are put in condition since this is divided into departments presided over by specialists in certain classes of repair. The fourth looks after engine repairs, blacksmith and welding work. Overhead trolleys make it possible to lift the engine from the chassis and move it to the most convenient place for making repairs. Exhaust gases from engines being tested are piped out of the building by attaching a flexible tube to the exhaust opening. The sixth floor has 14,000 bins for storing accessories and on the eighth and ninth cars are stored by hanging them from the ceiling. This doubles the capacity of the floors.

The building stands a towering monument to efficient service. It is an example of modern service methods expanded to the nth power. It is the result of complete realization of the fact that service gives mutual benefit to dealer and owner—it is not simply a one-sided advantage to the owner alone.

Service Facilities

The big feature of the building is the facilities for handling service. There is a standard price for every job on every one of the many models produced by the Overland company so that the customer knows before it is done exactly what the work is to cost him. Furthermore it is possible to say with great precision just when his car will be ready.

Figures on work were kept for over a year to determine just what each kind of work cost and the result is a fixed charge that can be maintained. The time for making a stipulated repair is known to be so much and the workmen must come within this time in 80 per cent of the cases in order to retain their positions. The car owner is met by a shop salesman who determines what repairs are necessary and before the work is begun the owner is advised just what the charges will be and when he may have his car. After the repair work is finished and the car turned over to the owner he is asked by mail whether or not the repair work was satisfactory. This gives the company a line on the success of the repair work and shows its interest in the customer. Every car which the company sells has its complete repair and service record kept and whether the work was done gratis or charged.

TO FINISH PHILLY SPEEDWAY

Philadelphia, Pa., May 26—The Philadelphia Speedway Association has at last taken some definite steps in the direction of pushing to completion the 2-mile track at Warminster, Pa. Heretofore, the work was carried on from the receipts of incoming members, but this process was found too slow. A meeting was held recently, and by consent of those present the officers of the association were authorized to raise $350,000 to finance and complete the speedway.

School children and others greet the relay-sociability party at Para Rapids, Minn.

Proving a Theory

Jefferson Highway Sociability-Relay Tour to Show Road's Military Significance

By B. S. Brown

IT started as a sociability run, in Winnipeg, but before the Jefferson Highway Association's relay tour was five miles over the border, its real significance, nationally and internationally, had been disclosed. The instant that Americans caught sight of the distinguished Canadians in the party, they cheered in a way to show unmistakably the warm friendship and sympathy that exists between the allies in the great war. Every community, nearly every farmer along the highway, was brought to a quick realization that here was a trafficway on which soldiers and supplies could be moved promptly, in emergency, across the continent from north to south. This was the almost spontaneous effect on the people of the run as it progressed. Officially, the run is proving that schedules can be maintained on the Jefferson highway; and data is being gathered for reports to the government on the availability of the Jefferson highway for military purposes.

Association Thoroughly Organized

It is well known that the Jefferson Highway Association is thoroughly organized in every county on the route, so that it is no new story to say that there was prompt action in making preparations for the approach of the tourists, but the extreme importance for military purposes of this highway, as now disclosed, is stimulating communities even to greater activity.

The present tour is comparatively a novelty in sociability runs, in that only three cars are making the entire trip from Winnipeg to New Orleans and back again. Ordinarily a sociability run consists of a tour by a number of people from ten to a hundred, who get more sociable with each other, and with the people along the route. The Jefferson highway plan is to provide a means for people of neighboring communities along the route to become more sociable with each other. This was the plan of the run last year from St. Joseph to Winnipeg; it was highly successful. This year the fine weather has kept the farmers, who turned out so largely in 1916, in their fields, and the tourists who join the main party for short trips have been largely townspeople.

The working out of the relay feature of the tour, has demonstrated the enthusiastic support given the association by its members, and the perfection of its organization. The principal relays were the motorists who joined the party for ten, or fifty, or 250 miles, under definite prearrangement. Secondary relays were the motor cars on various sections that traveled with the party as reserve equipment for the speakers. The third relay element was the motor cars held at night control subject to call.

Section of Jefferson highway near St. Joseph, Mo., which is typical of much of the road

Keep Close to Schedule

The schedules of the speakers were in relays, which of course was the basis of the plan. It was so arranged that usually the first car of speakers was able to get away towards the next control, about the time the second car arrived, thus greatly expediting the progress of the tour.

The fidelity to schedule was therefore extremely important, and any deviation would have been perhaps the more noticeable, than if the entire party came together to each place. Though there was the resource that the car due to leave could be held a few minutes, which was not necessary at any time.

The Jefferson Highway Association has state and county boards or committees in every state, and the province of Manitoba. It has local representatives in 264 towns. Announcements of the run, and the complete schedule, were distributed to all members and representatives sixty days before the run was to start. Various personal and circular letters were sent in the succeeding 30 days, through which all the relays were arranged for. The association had at its offices, long before the tour began, signed agreements for furnishing

the relays, and all the data concerning them. The only variation was in the number of motorists who met the tourists and traveled part way with them.

These escorts followed the speakers' cars, for the purpose of picking the speakers up and getting them to the next point promptly in case of accident. At every station, the three escorts were on hand, but in only one instance were they used.

At every night control two cars were held in readiness to answer telegraph or telephone summons, to replace a car of the main party that might break down, and carry the speakers to the next night control. Up to Kansas City, these reserve cars were not used, though they were ready at every control.

Military Significance Noticeable

The perfection of the relay organization, was one of the most significant demonstrations of the run. It was evident that the Jefferson Highway Association could of itself relay a small army from the north to the south, each local organization doing its bit by carrying the soldiers from its town to the next on the schedule.

The full response of members in bringing cars to maintain the relays, was perhaps even less suggestive of military possibilities than the response in road improvement.

The association had designated May 1 as Good Roads Day on the highway, and had sent suggestions for road work on that day. It had also urged that all roads be gone over carefully the day before the tourists would pass.

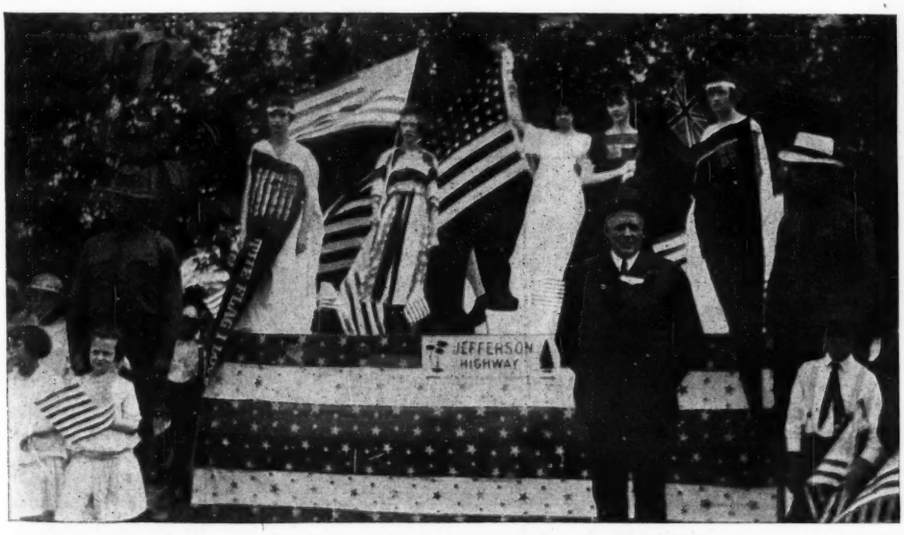
It was significant that there was hardly a square yard of road that could be improved with a little work, that had not shown evidence of recent improvement when the tourists passed. In some places the motor cars of the run were the first to make tracks in some of the patches. In many places teams and men which had been working on the roads in response to the call, were still at it when the cars came along, waiting for the greeting which was so heartily given. Of seventy-seven suggestions for improvement sent out since the inspection trip of the officers of the association, it was observed that seventy-six had been followed—and the materials were on the ground for the seventy-seventh!

Premier Norris of Manitoba in action telling of mutual interests of U. S. and Dominion

Intensive Work Under Way

The importance of such a response as this on road improvement cannot be overstated, in connection with possible use of the highway for military purposes. It is evident that the farmers would leave their plows and the business men their desks, to see that the roads were in shape to carry the soldiers or supplies that the government might order to go that way.

It is not said that the Jefferson highway is now in condition to bear heavy military traffic throughout its length; but the possibilities of use in an emergency are there, with the organization and the spirit to carry out the task.



The fair sex at Eagleville, Mo., greet party in royal fashion

The official party, which started at Winnipeg at 7 a. m., May 14, consisted of: Hon. T. C. Norris, premier of Manitoba; Fred H. Davidson, mayor of Winnipeg; Walter F. Tallman, street commissioner of Winnipeg; J. A. Macdonald, publicity commissioner for province of Manitoba; J. D. Clarkson, general manager of Jefferson Highway Association, and Mrs. Clarkson; J. A. Joseph, lieutenant, Pleasant Hill, La.

Twenty-three other Canadians relayed the official party from Winnipeg into the United States. Among the number were Hon. Thomas H. Johnson, minister of public works of the province; former Mayor Waugh of Winnipeg, now commissioner of waterways of the province, and members of the city and of the provincial councils.

The relay system as applied to the cars in the run, began at Winnipeg. The first car left the city at 7 o'clock, the others leaving at 10-min. intervals. The first car reached St. Vital 10 min. later; this car contained Mr. Clarkson, who saw that the stage was set for the speakers. When the second car, bearing the first contingent of speakers, arrived in St. Vital, 10 min. later, Mr. Clarkson started on to the next town. The second car left ten minutes ahead of the third, and so on. This system was maintained throughout the tour. And so carefully was the schedule prepared, and so faithfully was it observed, that only twice were there any deviations —in no case disappointment to waiting people.

St. Paul Meeting Impressive

St. Paul provided perhaps the most impressive meeting of the tour, and big things for the fellowship of nations, as well as for the highway, may grow from it.

Premier Norris had been greeted with the warmest enthusiasm at every stop. The people had been eager to see and hear him, hungry for a personal touch with the chief

official of the northern neighbor which had been in the war, and of which this country was now an ally. He had talked good roads, the Jefferson Highway, international sociability, at every stop, but everywhere the people wanted him to talk of the war. He did. He told how Canadians had responded to the call, especially how every Canadian, man, woman and child, was heart and soul in the war, working and planning. He brought the message to Americans to realize that not only the government, but every individual, had a duty and an opportunity. He had left everywhere deeper loyalty to country, and better appreciation of the individual's relations to the nation and the world.

Prominent Speaker

Premier Norris and Mayor Davidson, who had also spoken in the same key at other places, addressed a large gathering at luncheon in St. Paul. Former Governor Van Zandt of Minnesota rose after their talks; he declared, with tears in his eyes, that it was a great, a wonderful occasion, indicative of the friendship between nations, when an official of a foreign government could show to us so vividly the strength of bonds that bind in a common cause.

The Jefferson highway is strung with Union Jacks and Canadian flags, though the supply is running short. The party gave out more than 4,000 up to Kansas City, for everybody wanted them.

Mr. Johnson accompanied the party 100 miles into the states, to Thief River Falls, night control Monday night. He aroused the enthusiasm of highway boosters by declaring that the Jefferson highway would be built through the province; he was speaking as minister of public works, the province assisting municipalities in the improvement of roads.

Mayor Davidson of Winnipeg told of the plans for improving a park as the northern terminal of the Jefferson highway. The town planning commission of Winnipeg has submitted plans for a park, which have been accepted. The park will cover two city blocks within the city limits and $250,000 will be spent on its improvement. A detail will be an immense standard, electrically illuminated, as a Jefferson highway marker.

Ex-Mayor R. B. Waugh was mayor of Winnipeg when the Jefferson Highway Association was expanded to include Manitoba; and he was largely responsible for the extension to Winnipeg.

Two of the association's Minnesota directors, Daniel Shaw of Thief River Falls and J. K. Martin of Little Falls, accompanied the party through a large part of the state route.

An example of the reception in Minnesota was at Park Rapids, where the Commercial Club, with a band, met and entertained the entire party, taking them to Douglas Lodge, in Itasca Park, the hotel being opened a week ahead of time for the event.

The mayor of Minneapolis, and Senator Cashman, a director of the association, joined the party at Albert. This was a night control. Arrangements had been made for an indoor meeting; but more than 2000 people were waiting to greet the tourists, and the meeting wa sheld in the open.

Chairman A. Marston, Chief Engineer McDonald, James H. Harvey, Leon, Iowa, director of the association, and H. C. Beard, member of the Iowa Highway Commission, met the party at the Iowa line, and went with it through the state. The commission had previously ordered all the local officials to put the Jefferson highway into first-class condition through the state. Des Moines, the headquarters of the association, showed that prophets often have honor in their own countries, for it gave a great reception. There were British flags at each plate at the banquet; and Ralph Bolton, president of the Greater Des Moines Club, went as a speaker beyond the state line into Missouri. At Lamoni, the party was joined by W. A. Hopkins, vice-president of the association.

Governor Gardner of Missouri explicitly instructed the state highway commission to care for the tourists in the state; the members met the party at the state line, George McIntosh of St. Joseph being well known to all. Here also came John M. Malang of Joplin, vice-president for Missouri, and E. J. Kling of Nevada, Mo., a director.

Missouri gave a fine welcome, in the reception at Eagleville. This town has 330 inhabitants; but it is very much alive. An arch saying "Welcome" was over the street where the party entered the town—and another arch, "Come Again," was the last thing seen as the cars passed out. The people had prepared an elaborate program.

On a special platform, was a tableau; one young lady representing "Liberty," others representing the allies. The young lady representing Canada could not secure a Canadian flag, so she had painted the coat of arms on her costume.

At Eagleville, was an example of the confidence with which the schedule had been studied. Mr. Clarkson drove in on time to the dot—and the tableau was exactly ready for presentation. But it was the same everywhere—with no delays for the tourists, or the people.

Greeted with Flags

Bethany, Mo., gave a colorfully patriotic greeting. There were flags every 25 ft. on each side of the two miles of Jefferson highway through the town.

There was wonderful weather until Kansas City was reached—just a hint of rain Saturday. They came into Kansas City under a shining sun, arriving exactly on time; but 10 min. after the last car had unloaded at the Hotel Muehlebach, a downpour began, the first rain in several weeks. The tourists were met at Kansas City by E. E. Peake, secretary, and members of the Kansas City Motor Car Dealers' Association, who had arranged a tour of the city, and dinner at the Hillcrest Country Club. Judge John A. Eaton, chairman of the Kansas City committee, met and conferred with the party here.

State highway commissions, governors, county officials and city officials have been generous in arranging for their part in promoting the tour. The mayors have been particularly appreciative of the highway, and in every town have sent invitations to the association's representatives, and the Canadian officials, at Winnipeg, extending courtesies. The mayors were always on hand to greet the party.

In nearly every town that was passed through during school hours, school was dismissed to give the children a chance to do their part in the welcoming.

Members of Iowa State Highway Commission meeting Jefferson highway tourists at North state line

Routes and Touring Information

Quincy, Ill.-Denver-Sacramento

QUINCY, Ill.—Editor MOTOR AGE—Give a route from here through St. Joseph, Denver, Colorado Springs, Glenwood Springs, Salt Lake City to Sacramento.—E. B. Hillman.

From Quincy, Ill., drive to Hannibal, Mo., New London, Perry, Mexico, Columbia, Rocheport, New Franklin, ferry across Missouri River, Boonville, Arrow Rock, Marshall, Grand Pass, Waverly, Lexington, Wellington, Ripley, Independence, Kansas City, Kansas City, Kan., Bonner Springs, De Soto, Eudora, Lawrence, Topeka, Silver Lake, Rossville, St. Mary's, Wamego, Manhattan, Ogden, Fort Riley, Junction City, Chapman, Detroit, Abilene, New Cambria, Salina, Ellsworth, Wilson, Dorrance, Russell, Victoria, Hays, Yocemento, Ellis, Ogallah, Wakeeney, Quinter, Grainfield, Oakley, Colby, Brewster, Goodland, Ruleton, Kanorado, Burlington, Colo., Stratton, Seibert, Flagler, Limon, Ramah, Calhan, Colorado Springs, Pikeview, Monument, Palmer Lake, Greeland, Castle Rock, Sedalia, Littleton, Denver, Golden, Idaho Springs, Sulphur Springs, Kremmling, Glenwood Springs, Newcastle, Silt, Antlers, Rifle, Rulison, Grand Valley, DeBeque, Palisades, Grand Junction, Fruita, Mack, Cisco, Thompson, Elgin, Green River, Woodside, Wellington, Price, Helper, Castle Gate, Colton, Thistle, Springville, Provo, Pleasant Grove, American Forks, Sandy, Salt Lake City, Magna, Garfield, Grantsville, Iosepa, County Well—water for radiator only—Fish Springs Ranch, Ibapah, Utah, McGill, Nev., Ely, Greektown, Reipetown, Eureka, Austin, Alpine Ranch, Sand Springs, Salt Wells Ranch, Fallon, Hazen, Wadsworth, Reno, Verdi, Truckee, Colfax, Auburn, Roseville to Sacramento.

Volumes 5, 7 and 8 of the Automobile Blue Books published by the Automobile Blue Book Pub. Co., 910 South Michigan Avenue, Chicago, contain complete running directions for this trip as well as information on points of interest, condition of roads, etc.

Coffeyville, Kan.—Jacksonville, Ill.

Coffeyville, Kan.—Give best route from here to Jacksonville, Ill.—P. P. Cable.

From Coffeyville, proceed to Independence, Cherryvale, Chanute, Petrolia, Humboldt, Iola, Ottawa, Wellsville, Edgerton, Olathe, Lenexa, Overland Park, Waldo, Mo., Kansas City, Belleview, Liberty, Prathersville, Excelsior Springs, Lawson, Polo, Cowgill, Plymouth, Ludlow, Utica, Chillicothe, Laclede, Brookfield, Bucklin, Macon, Clarence, Lentner, Shelbina, Lakenan, Monroe, Oakwood, Hannibal, Kinderhook, Barry, Hadley, Baylis, New Salem, Griggsville, Valley City, Bluff to Jacksonville.

Vols. 7 and 5 of the Automobile Blue Book published by the Automobile Blue Book Pub. Co. contain complete running directions for the above trip.

Henryetta, Okla.-Harrisburg, Pa.

Henryetta, Okla.—Editor MOTOR AGE—Am interested in a route from here to Harrisburg, Pa.—R. B. F. Hummer.

From Henryetta, drive to Dewar, Hoffman, Hitchita, Wainwright, Muskogee, taking the Jefferson Highway from there to Joplin, Mo., From Joplin the route lies through Diamondville, Wentworth, Pierce City, Verona, Aurora, Marionville, Billings, Republic, Springfield, Galloway, Rogersville, Diggins, Seymour, Mansfield, Macomb, Norwood, Mountain Grove, Dunn, Cabool, Simmons, Houston, Raymondsville, Licking, Edgar Springs, Rolla, St. James, Cuba, Leasburg, Bourbon, Sullivan, Anaconda, St. Clair, St. Louis, East St. Louis, Collinsville, Troy, Highland, Greenville, Mulberry, Hagerstown, Vandalia, Altamont, Effingham, Greenup, Martinsville, West Terre Haute, Terre Haute, Brazil, Plainfield, Indianapolis, Greenfield, Knightstown, Dunreith, Germantown, Centerville, Richmond, Ind., Eaton, Ohio, Dayton, Harshman, Springfield, Columbus, Granville, Newark, Linnville, Zanesville, Cambridge, Washington, Morristown, Bridgeport, Wheeling, W. Va., Elm Grove, West Alexander, Pa., Claysville, Washington, Houston, Canonsburg, Bridgeville, Carnegie, Pittsburgh, Sardis, Mamont, Saltsburg, Indiana, Pine Flats, Barnesboro, Carrolltown, Altoona, Juniata, Bellwood, Tyrone, Schoenberger, Alexandria, Smitheld, Huntingdon, Mill Creek, Lewistown, Thompsontown, Millerstown, Liverpool, New Buffalo, Speeceville, Coxestown, to Harrisburg.

St. Louis, Mo.-Yellowstone-Los Angeles

St. Louis, Mo.—Editor MOTOR AGE—Furnish routing from here to Los Angeles via Yellowstone Park, Glacier Park, Columbia River Highway, Seattle, Portland, San Francisco, Yosemite and Sequoia National Park.—Reynold F. Buder.

From St. Louis, drive to Dwyer, Ellisville, Gray Summit, Washington, Berger, Hermann, Morrison, Chamois, Osage City, Jefferson City, Centertown, McGirks, California, Clarksburg, Tipton, Otterville, Sedalia, Knobnoster, Montserat, Warrensburg, Centerview, Holden, Strassburg, Pleasant Hill, Lee's Summit, Kansas City, Kansas City, Kan., Leavenworth, Lowemont, Atchison, Lancaster, Huron, Everest, Hiawatha, Falls City, Neb., Verdon, Auburn, Nebraska City, Plattsmouth, LaPlatte, Fort Crook, So. Omaha, Omaha, Elkhorn, Waterloo, Fremont, Ames, North Bend, Schuyler, Richland, Columbus, Duncan, Clarks, Central City, Chapman, Grand Island, Alda, Shelton, Gibbon, Kearney, Willow Island, Gothenberg, North Platte, Sutherland, Paxton, Ogallala, Brule, Bigspring, Chappell, Lodgepole, Sidney, Kimball, Bushnell, Cheyenne, Chugwater, Wheatland, Uva, Glendo, McKinley, Douglas, Glenrock, Casper, Stone Ranch, Johnsons Ranch, Powder River Ford, Waltman, Arminto, Lost Cabin, Reids Ranch, Thermopolis, Kirby, Chatham, Neiber, Worland, Manderson Basin, Otto, Burlington, Cody, into the eastern entrance to Yellowstone Park, through the park and out at Yellowstone Station, then to Lake Post Office, Hutchins, Jeffers, Ennis, Virginia City, Ruby, Sheridan, Twin Bridges, Silver Star, Butte, Anaconda, Phillipsburg, Maxville, Hall, Drummond, Bearmouth, Bonita, Clinton, Missoula, Ravalli, Ronan, Polson, Big Arm, Elmo, Dayton, Rollins, Kalispell, Belton, Apgar, Glacier National Park. Return to Missoula and proceed to Huson, Alberton, Superior, St. Regis, Deborgia, Saltese, Mullan, Ida., Wallace, Kellogg, Kingston, Cataldo, Couer d'Alene, Spokane, Wash., Deep Creek, Reardan, Creston, Wilbur, Almira, Coulee City, Spencer, Douglas, Waterville, Orondo, Wenatchee, Vantage Ferry, Ellensburg, Wash., Cle Elum, Easton, Snoqualmie Pass, Northbend, Snoqualmie Falls, Fall City, Camp on, Redmond, Kirkland, Seattle, Georgetown, Riverton, Orilliam, Sumner, Ardena, Tacoma, Lakeview, Olympia, Tumwater, South Union, Grand Mound, Centralia, Chehallis, Cowlitz, Toledo, Castle Rock, Kelso, Carrolton, Kalama, Martins Bluff, Woodland, Sarah, Felida, Vancouver, Portland, Ore., Oregon City, Salem, Liberty, Jefferson, Albany, Tangent, Shedds, Halsey, Harrisburg, Junction City, Eugene, Goshen, Walker, Cottage Grove, Drain, Yoncalla, Oakland, Edenbower, Roseburg, Myrtle Creek, Riddle, Canyonville, Summit, Wolf Creek, Grants Pass, Rogue River, Gold Hill, Central Point, Medford, Ashland, Yreka, Dunsmuir, Castella, LaMoine, Redding, Anderson, Cottonwood, Red Bluff, Corning, Orland, Willows, Maxwell, Williams, Arbuckle, Woodland, Dixon, Vacaville, Fairfield, Rockville, Cordelia, Benicia, Martinez, Walnut Creek, Oakland, San Francisco, Manteca, Salida, Modesto, Empire, Waterford, LaGrange, Yosemite, Fort Monroe Checking Station, Chinquapin Station, Aldercreek Station, Wawona, Fresno Flat, Coarse Gold, Fresno. Inquire at Fresno as to best route to Sequoia National Park. From Fresno the route continues to Los Angeles, through Fowler, Kingsburg, Tulare, Delano, McFarland, Bakersfield, Newhall, San Fernando, Burbank, Tropico, to Los Angeles.

Volumes 5, 7 and 8 of the Automobile Blue Books published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, contain complete running directions for this trip.

Vinton, Iowa-El Paso, Tex.

Vinton, Iowa—Editor MOTOR AGE—Outline routing from here to San Antonio, Tex., by way of Kansas City and McAlester, Okla.—D. C. Knupf.

From Vinton go to Shellsburg, Palo, Cedar Rapids, Walford, Middle Amana, Marengo, Victor, Brooklyn, Grinnell, Kellogg, Newton, Colfax, Des Moines, Bethany, Bridgeport, Pattsonburg, Winston, Cameron, Plattsburg, Trimble, Smithville, Gashland, Kansas City, Harrisonville, Adrian, Butler, Rich Hill, Arthur, Horton, Nevada, Moundville, Liberal, Nashville, Galesburg, Joplin, Galena, Afton, Pryor, Wagoner, Muskogee, Crowder, McAlester, Durant, Denison, Sherman, McKinney, Dallas, Grand Prairie, Dalworth, Arlington, Handley, Fort Worth, Weatherford, Mineral Wells, Caddo, Breckenridge, Albany, Hamby, Abilene, Trent, Escopa, Sweetwater, Roscoe, Loraine, Colorado City, Westbrook, Coahoma, Big Spring, Stanton, Midland, Grandfalls, Pyote, Pecos, Toyah, Kent, Van Horn, Sierra Blanca, Fabens, Belen, Ysleta to El Paso.

Mansfield, Ill.—Memphis, Tenn.

Mansfield, Ill.—Editor MOTOR AGE—What is the best route from here to Memphis? Where do we cross the Ohio river?—N. Patterson.

From Mansfield go to Lodge, Monticello, Bement, Oakley, Decatur, Mount Auburn, Taylorville, Vanderville, Raymond, Litchfield, St. Louis, East St. Louis, Ill., Edgemont, Belleville, Freeburg, New Athens, Lenzburg, Old Town, Marissa, Tilden, Coulterville, Pinckneyville, Vergennes, Murphysboro, Carbondale, Makanda, Cobden, Anna, Mill Creek, Tamms and Unity to Cairo. The Ohio river is crossed by ferry 4 miles out of Cairo. Continue to Wickliffe, Ky., Bardwell, Arlington, Clinton, Moscow, Jordan, Union City, Tenn., Troy, Obion, Trimble, Newbern, Dyersburg, Fowlkes, Chestnut Bluff, Maury City, Johnson's Grove, Brownsville, Stanton, Mason, Gallaway, Arlington, Ellendale, Bartlett, Raleigh to Memphis.

Vols. 5 and 6 of the Automobile Blue Book, published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, Chicago, contain running directions of this trip from Decatur on.

Evolution of Spark Plug Design

No Porcelain Made Impervious to Breakdown—Heat 1350 Deg.

INDIANAPOLIS, Ind., May 26—The evolution of spark plug design from the early days when it was introduced by Cadillac and Winton down to the present day, detailing step by step the developments from the earliest types of internal combustion engines through the processes of manufacture of the modern spark plug and dwelling on the difficulties to be met with in the way of temperature and high-tension current, Albert Champion, president of the Champion Ignition Co., Flint, Mich., addressed the Indiana Section of the Society of Automotive Engineers at the Claypool hotel last night. Mr. Champion voiced the opinion that a virtual carbonizing furnace exists in some of the present-day engines, thus causing a disintegration of the porcelain insulation.

At the close of the talk the matter was discussed by representatives of the Champion Spark Plug Co., of Toledo, and the Rajah company, who were in attendance at the meeting.

Traces Spark Plug History

In tracing the history of the spark plug in this country Mr. Champion mentioned that the first to be made here were those manufactured by Cadillac and Winton, who made them for themselves. The great difficulty in the early days of the spark plug was the breakage of the porcelain. They could not be made to stand up and they also had a pronounced tendency for absorbing oil, which soon rendered them useless, as it destroyed the insulating properties of the porcelain, allowing the high tension current to leak through to the shell.

Insulating materials were next taken up. These are porcelain, steatite, mica and glass. The search for the proper ingredients to enter into the manufacture of the porcelain was explained, and it was shown how these are brought from different parts of the world. The principal ingredients of the porcelain are kaolin, flint, feldspar and ball clay. These must be all brought together and mixed in the proper proportions and then fired at the right heat in the same way that steel must be given the proper heat treatment. Mr. Champion stated that it was not of advantage to secure the highest possible heat, as it is just as possible to overheat the clay as it is to overheat a steel in its heat treatment.

The best porcelain is the one which has the least amount of leakage of electrical current, but there is no porcelain made which has not a point at which it breaks down. It must be remembered that in a cylinder which is firing with too rich a mixture, a virtual carbonizing furnace exists, and this soon has its effect on the porcelain of the plug. All the porcelains used are what are classified as soft porcelain, and these will absorb both carbon and water. When carbon is absorbed the porcelain is transformed in its molecular formation and the leaking through the insulator increases.

Speaking of steatite, which was used as the insulating material for the Bosch plugs, which are no longer manufactured, Mr. Champion explained that this is a soapstone or talc stone. It has a high dielectric strength, but it is difficult to glaze. The procedure followed in the manufacture of the steatite plugs is to first vitrify and then to use a low-fusing point glaze. It has been found best with this type of insulation not to use a glaze at all, but to rely upon a high polish.

There are two kinds of mica plugs, the wrapped type and the washer. Mr. Champion said that the difficulty with this type is that there is a large percentage of throw-outs, due to the fact that the mica is so easily affected. Even the moisture of the hands, he said, will have its effect on the plug and reduce the ability to hold current. The chief difficulty, he pointed out, is the fact that once the mica absorbs oil it leaks badly. The amount of leakage of a mica plug that is unaffected by dampness or oil is very small.

Glass is bad, according to Mr. Champion, because it is weak mechanically and leaks like the other materials. For this reason it has never been used extensively for spark plugs, although it has been experimented with to a large extent.

Mr. Champion then went into the design of the plug itself. He took up the assembly of the insulator and the central electrode and explained the different methods that are used for cementing the center wire in place, or for clamping it and holding it tight with gaskets, etc. The materials for the central electrodes were also covered, and it was stated that nickel chromium, while good in many respects, is electrolytic, having the tendency of disintegrating under the influence of a heavy current. Some use monel metal for the spark plug wires. This is a copper nickel alloy, being particularly valuable for the relatively small amount of contraction and expansion under changes of temperature. Mr. Champion expressed his liking for the pure nickel.

The discussion on the paper clearly brought out the difficulties under which the manufacturers of spark plugs are working in order to meet the extreme requirements of dielectric and physical strength under the high temperatures of combustion. For instance, in mentioning the fact that the best of insulators become conductors at very high temperature, Engineer Rody of the Champion Spark Plug Co., Toledo, Ohio, stated that he had made experiments which showed that the temperature reached by the insulator gets as high as 1350 deg. F.

Another point made by Mr. Rody in illustrating the improvements made in domestic porcelains is that in running an engine with spark plugs made three years ago it was found that the plugs could not stand up after the engine reached 1800 r. p. m. This was cited as an example to show that the engines of today are more oily now when running at higher temperatures. This fact was also stated to bear on the observation made by Mr. Champion that the mica plug would be under great difficulty because of the condition that once the mica is filled with oil its insulating qualities are destroyed.

Carbureter Blame Considered

Considerable discussion was also given, which brought out the fact that the carbureter is often blamed for troubles which are inherent in the spark plug. One of these is irregular firing on acceleration, due to the leakage of the high tension current through the insulator, thus tending greatly to weaken the spark.

Gregory Flynn, sales engineer of the Rajah company, pointed out the fact that the manufacturer often did not mount the plugs properly. He said that the engine was first designed and then the question as to where the spark plug could be placed was decided later. He pointed to the lessons derived from racing on this point, and showed how in the racing engine the location of the spark plug is given very careful consideration.

Mr. Flynn mentioned the Delage and Peugeot plug mountings as good examples where no trouble is experienced with the plugs. He compared this with the early Deusenberg engines, where the plug was mounted through a brass cap, which acted as a heat insulator. These engines had continuous plug trouble until the locations were changed. The Cadillac 1913 was mentioned as another example of where the plug had to be changed in order to provide better cooling.

To Aid Motor Transportation

A. A. A. Pledges War Assistance to Government at Annual Meeting

CLEVELAND, Ohio, May 25—The American Automobile Association at its annual meeting in this city today voted to render every possible assistance to the government both in motor transportation and in the sale of Liberty bonds. A motor car transportation committee was appointed. The sale of Liberty bonds will be effected by setting aside a day, probably June 7, which will be known as the A. A. A. Liberty bond day, at which time car owners and dealers throughout the country will devote the day to further the sales of the bond issue. Officers and directors were elected, and numerous other important details discussed and acted upon.

The meeting, which was attended by ninety-one delegates, was opened by Dr. H. F. Rowe, Baltimore, Md., president, who introduced Mayor Davis of Cleveland. The mayor made a short address of welcome. He was followed by Myron T. Herrick, ex-ambassador to France and now a senator from Ohio. Mr. Herrick came to urge the coöperation in the Liberty bond issue, and told of the lack of preparations which allowed this country but one immediate method for aiding the Allies and which he stated was through its great financial power. His address was enthusiastically received and was elaborated upon by George C. Diehl, chairman of the A. A. A. good roads board, who read a letter from the treasury department advocating the Liberty bond day campaign. John C. Wetmore of the N. Y. Evening Mail told of his encouraging experience with the New York dealers whom he induced to sell the bonds, and the delegates then voted to extend the fullest coöperation to the plan.

Reports Are Read

Various reports of the officers were read, and showed considerable roads and touring activities. Dr. Rowe, making his yearly report, told of the work accomplished through the last twelve months, and added that there was much additional to be done, pointing out the existing unjust taxation, the need for national road systems, lack of touring information bureaus, the problem of National parks, and other like matters.

H. A. Bonnell, treasurer, gave his report, which showed that the association has a total sum of $15,359.94 on hand. Osborne I. Yellott, chairman of the legislative board, reported the completion of a uniform traffic law, and told of the registration of 100,000 car owners who have signified their willingness to extend every aid to the government in the present crisis.

Officers and delegates were elected as follows:

Dr. H. M. Rowe, president; Ralph W. Smith, Colorado, vice-president; P. J. Walker, California, vice-president; D. Jameson, Pennsylvania, vice-president; Royal Scott, Toledo, Ohio, vice-president; A. J. Lupton, Indiana, vice-president; Preston Beldin, Virginia, vice-president; H. A. Bonnell, New Jersey, treasurer; John A. Brooks, Connecticut, secretary; A. G. Batchelder, chairman of the executive committee.

The afternoon program included a discussion by John A. Wilson, former president of the association, in which he told of the government's plans for mobilizing motor cars. He stated that the regulations allowed for companies comprising twenty-seven passenger cars and two roadsters and one truck to each company, and that it would be impossible for companies otherwise formed to receive governmental recognition.

A discussion on how traffic laws can best be emphasized and accelerated was opened by Mr. Yellott, who called attention to his recently formulated uniform traffic regulations. He stated that suggestions on these regulations would be welcomed during this year and would be given thorough consideration so that next spring the laws would be ready for the fullest support of the association.

W. S. Gilbreath, Detroit; A. Fifoot, Connecticut, and P. C. Wolff, Pennsylvania, talked briefly on the subject of marking roads along uniform lines. In the main they agreed that, except for southern California, but little result has been secured as yet in determining some standard system for marking roads.

C. C. Kilbury, Toledo, discussing methods for stamping out car thievery, told of a plan for marking the car serial number and the owner's name in opposite lower corners of the windshield by means of acids. He believes that dealers in glass will coöperate and refuse to sell windshields to any who cannot prove their ownership of the car on which the glass is broken, and that in this way thievery of cars can be reduced.

New members numbering 1,083 and belonging to six new clubs were announced. The membership of the motor transport committee was taken up and resulted in the following membership: Osborne I. Yellott, Indiana, chairman; George C. Diehl, Buffalo, N. Y.; George Kyle, Akron, Ohio; H. C. Clarke, Minnesota; A. H. Eastman, Illinois, and Steadman Bent, Pennsylvania.

The discussion of a meeting place for the next annual convention resulted in the selection of Washington, D. C., and it is likely that it will be of two days' duration.

The A. A. A. has 102,600 members, all of whom will be urged to organize into company units of twenty-seven five-passenger or seven-passenger touring cars, two high-speed roadsters, one light truck and forty men. The companies will be commanded by a carmaster, picked from the ranks, who will have a rating of sergeant of the first class, three assistant carmasters with rank of sergeant, one machinist with rank of sergeant, one helper with rank of corporal, one watchman, ranked as private of the first class, one trumpeter messenger also rated as private of first class, one cook, and twenty-eight drivers with rank as sergeants. Five additional officers will be necessary for the battalion units. The commander will have the rank of major. As fast as the state and club organizations fill their company units they will report to the headquarters of the A. A. A. at Washington, which in turn will report to the government. This plan was arranged by John A. Wilson, a cousin in President Wilson and president of the organization's preparedness committee.

ARRANGE INTERCITY RUN

Cleveland, Ohio, May 25—Following the meeting of the American Automobile Association today, arrangements for the Intercity Reliability Run were discussed and arranged. The schedule is:

First day—Buffalo to Elmira, 188.4 miles with Danville noon control. All of the road on the first day's journey is improved state road except 24.1 miles of dirt road between Danville and Elmira.

Second day—Elmira to Syracuse, 209.6 miles; Norwich noon control. All of the second day mileage is state road except 21.9 miles, which is divided so that that 11.9 miles will be traveled in the morning and 10 miles in the afternoon.

Third day—Syracuse to Clarence County Club, 173.2 miles; Rochester noon control. This is all state road. Hotel and garage service has been investigated and arranged for. Each contestant will have to provide an observer in a car other than the contestant. There will be brake tests made the day before the run for safety purposes. Fifty entries have been received to date. These include Chicago, ten; Indiana, five; Detroit, ten; New York, ten; Rochester, five; Buffalo, ten.

Trailing a Trailer into the Rockies

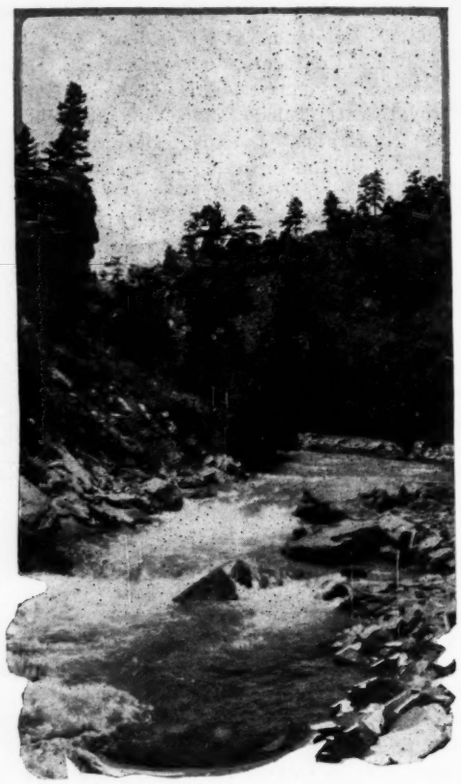
By W. A. LIPPMAN

In Three Parts—Part III

MUCH has been said already about the decreased mileage due to trailer travel, but in our case we did not observe any great difference. We always have kept the most accurate account of gasoline consumption and mileage, having a specially printed loose-leaf book for the recording of all such data, and the fact that our trailer trip this summer was over practically the same route we followed with the same car two years ago gave us a splendid opportunity for comparison of gasoline, oil and tire costs. We obtained $\frac{4}{10}$ mile less to the gallon of gas and 5 miles less to the quart of oil, while our tire mileage, to the best of our knowledge, remained the same. As the trip covered only 2600 miles we did not drive tires to the point of wearing out, but a close observation of the wear on the tires, together with mileage obtained after the trip, convince me that the effect of the trailer was negligible as far as the tires were concerned, one reason for this being the fact that we shifted several hundred pounds of luggage which formerly went into the car, the trailer carrying this load.

Trailers Can Travel

No doubt the impression has gone forth that trailers can not travel fast because many makers of hard-tired trailers do not recommend their use at speeds higher than 15 m.p.h., but pneumatic-tired trailers go as fast as anyone cares to go. We have been passed several times by trailers when we were going 25 m.p.h., and at frequent intervals, on good roads, with no traffic in sight, we have sped merrily along at 30 m.p.h., which is our limit when touring no matter how fine the roads may be or what the temptation for faster going. For the most part we idle along at 20 m.p.h., which carries us over a long span of ground in a day, gives us a chance to see the country as we go along and is not a strain on car, driver or party. At 20 m.p.h., over most roads the trailer is almost forgotten. A garage at Columbia, Mo., vouches for the truth of the story that last summer an eastbound tourist lost his trailer more than 10 miles out of Columbia and did not realize it until he was almost in the city and went scurrying back for it, finding it at the roadside where it had rolled after becoming unhitched in some unaccountable fashion.



Almost anyone can take good pictures in country like this, especially of the trout streams

Must Watch the Road

Whether the story is true or not, it is a fact that there is little to pronounce its presence, excepting for the steadying effect it has on the car, preventing swerving, no doubt having the same effect as a stabilizer on an airplane. At times this steady effect gives way to a swinging or whip-snap sensation if corners are taken too fast or too great speed is made on roads that slant a great deal. There also is a noticeable demand on the driver to watch the road more closely than when touring without a trailer, for the very good reason that there are now six wheels to pass over road defects and obstructions instead of four, and two of these wheels are removed quite some distance to the rear. On the whole, the least of the looked for driving complications is that of watching the turns at corners and curves. We were surprised to find on turning corners that the trailer wheels followed very closely in the tracks of the car wheels; in fact, we made several tests on freshly-sprinkled streets, where the tracks were easiest observed. At speeds of from 15 to 20 m.p.h. the wheels of the trailer swung outside of the circle of the car wheel tracks 4 in., while at 25 m.p.h. they were shown to be 6 in. out of the curve. Where the streets were banked the departure diminished considerably. This proved conclusively to us that there were no grounds for fears about wide swinging away from the line of travel, and this knowledge dismissed from our minds any feeling of alarm in turning even the sharpest of corners. During the 2600 miles of our trailer trip

Mishaps will come, even with the best of cars and trailers, and there are times, as here, when nothing but a horse is of value. Add reasons for good roads

This is a dangerous way to carry a tent pole, besides making your outfit look as if the horses had just been unhitched from the strange shaft pole

in country and city travel, many times in the densest of traffic or on narrow defile roads, we never so much as brushed car or trailer on vehicle or other roadside objects.

There is another distinct driving element in trailing, that of slanting and crowned roads. It is very difficult in ordinary touring to become accustomed to the steeply-pitched roads which some road commissions construct in a mistaken idea of what a properly crowned road should be. Even a seasoned cross-country tourist well may hold his breath when attempting to maintain a safe position on the slope of an over-crowned road. The whip of a trailer intensifies that sensation if the speed is more than 15 m.p.h., so it is an excellent safety measure to travel quite slowly over such roads. There are few roads, however, that need be given second thought, and even the mountain roads are quite safe for trailer travel. We readily proved this last summer, for we traveled hundreds of miles over mountain highways with very steep grades and in all sorts of weather without risk or mishap occasioned by the trailer.

Avoid Muddy Roads

Generally speaking I should not advise trailing on muddy roads, even if you feel compelled to hurry on it will pay to wait. We proved this to our own satisfaction when we returned from the Rockies. After spending several interesting days at Cheyenne taking in the Frontier Days Celebration and glorying in the possession of our own cottage on wheels while hundreds slept in hallways of hotels, on porches and in yards and thousands of others slept in every conceivable camping and touring bed that ever was made, from the bare ground up, we fully appreciated our comfortable trailer and were reluctant to continue eastward. That first day on the Lincoln highway, with a start at 9:40 in the morning, we had no trouble whatever reaching Big Springs, 160 miles away, by 6:45 in the evening. The next day we started at 8:40 and within an hour or two found ourselves racing with the storm clouds which appeared just over the ridge that follows the Platte river. By noon we were running through heavy showers, and before 2 o'clock we met with steady pouring rain, which followed all afternoon for a distance of 90 miles.

These Nebraska roads are as level as Michigan boulevard, however, and barring a few very small grades you can go on as long as there is bottom at all. We found bottom most of the time, and though we slithered across and back from ditch to ditch at times and frequently found ourselves almost straight across the road with our trailer at right angles to the car we managed to get on into dry territory with a total mileage for the day of 167 miles. In our estimation the majority of the last 90 miles were twice the accustomed length. We made our evening stop at 7:15, and as we had spent about an hour lunching and getting gasoline, etc., we had averaged some 18 m.p.h. running time. The next day was the red-letter day of our seven weeks' trip so far as mileage is concerned. With an 8 o'clock start we made 223 miles, passing through Omaha before 6, eating supper there and continuing on some miles south of Council Bluffs before we stopped for the night.

Oh! that these next words could never have been written. That night! Peacefully though wearily going to sleep with the recollection of having made 550 miles in these last three days—some mileage even for a tourist party without a trailer—it was a frightful shock to be awakened at midnight with the beating of a drenching rain on the trailer tent canopy. Those last few miles made before we stopped for the night had been dusty beyond belief, dusty as only an Iowa dirt road can get after a dry spell of seven weeks. The swish of the rain on the trailer top pictured vividly the condition of the roads ahead the next morning. However, never given to worrying much about tomorrow's travel we slept on and awoke to find the downpour not the least bit lessened nor any indications of a let-up. A friendly farmer near us kindly put us up for breakfast and afterward sold us Prince, the cutest of ten-day-old fox terrier pups. By 10 o'clock we concluded there was no use waiting for a cessation of the storm, so we started out.

Tested Trailer's Ability

If you ever have traveled over the hills of the Nishna-botna and Missouri river country after a rain you know enough not to try it again. But we were impelled not so much by a desire to push on as by a determination to find out what a trailer would do under such conditions. We put chains on the rear car wheels and ropes on the front wheels, then small ropes on the trailer wheels. For miles we fairly wallowed in slushy mire from 6 to 10 in. deep but with a bottom underneath, due to the fact that the roads had been so dusty that the rain had not penetrated through the dust to the

With goods roads all is well. This stretch is of cement near Fremont, Neb. There is no danger of miring and waiting for a rescuing team even in rainy weather

A dense grove of aspen along the road makes the process of trailing a trailer into the Rockies even more enjoyable

hard surface beneath. But after making 4 miles in about 2 hrs. of steady traveling with frequent stops for radiator filling and cooling off we began the struggle through mud and clay hills in earnest. Several miles of roadway had been freshly worked by nearby farmers, with the dust turned under and loose soil on top, and what the rain had made of that stretch of road may just as well be left to the reader's imagination—the writer declines to give any description of it. We plowed on at from 1 to 4 m.p.h., stopping at times to shovel the mud and clay from wheels, fenders, running board and trailer top—never out of first gear except on the down grade when we found we could travel in second. Recollection fails to bring back any high gear traveling in the 25 miles we made that day. Lucky we were to have plenty of spare oil, for it was needed.

Dirt Roads Impossible

In the entire 25 miles, traveling until after 5 o'clock in the afternoon, we met not more than three farmers' teams and but one car, and that in one of the richest farming countries in the United States. The one car that we did meet passed us while we were being pulled out of a deep mud hole into which we had slipped sideways. It took a good team to get us out, and the car—a well loaded tourist car from Dakota—had all it could do to pull itself through the mire and, though willing to help, was powerless. That 25-mile trip was truly illuminative. For one thing it proved to us beyond a doubt that it was useless to travel with a trailer over dirt roads in hill country after a heavy rain.

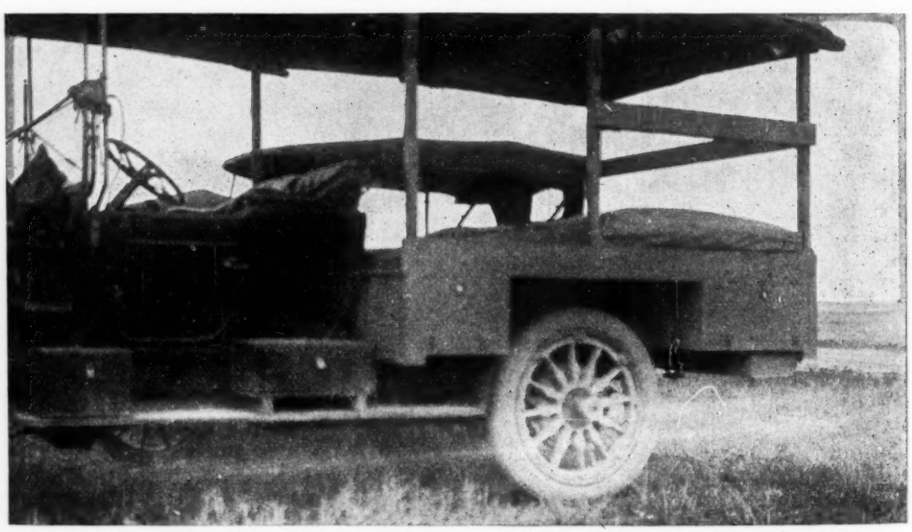
On the level we managed to pull along, but on hills where the grades were more than 5 per cent, we found the going a strain, some short hills with turns in them taking from 15 to 20 min. to negotiate. We were stuck in the mud for keeps but once, as referred to, and were there for an hour. A mechanical towing device which we carry was of no use as the car was badly tilted to one side. When we attempted to use the device from that side which was nearest the fence line we merely tilted the car farther until it seemed nothing could keep it from going over on its side. We did not have enough cable with us to cross to the trees on the other side of the roadway and were unable to resort to the expedient of burying a dutchman—fence-post or short log underground—ahead to get a firm hitch, because the ground here was so soft that there appeared to be no bottom. We finally unhitched the trailer and commandeered a team from a passing farmer. He pulled us back on to firmer soil, and rehitching the trailer we went on.

One of the pictures gives some idea of the amount of mud which was thrown on the top of the trailer by the wheels of the car—increased because of the continuous low speed work. We estimated that we cleaned off not less than 300 lbs. of mud and clay on three different occasions during that momentous day. That night we were glad to put up with a miserable small town hotel, and the next day before noon the roads were dry enough to travel on without let or hindrance—with such soil is Iowa blessed. We had the satisfaction of knowing what a trailer will do in deep mud, with a powerful motor to pull it, and we gladly pass the dearly purchased information on to others so they may go and not do likewise. When it rains to excess stay where you are, and you will make time by it. We were ahead one rich and ripe experience and one baby pup, which the women of the party took keen delight in bottle-feeding for the rest of the trip. The mud of that memorable day never has been removed altogether from the trailer and probably never will be.

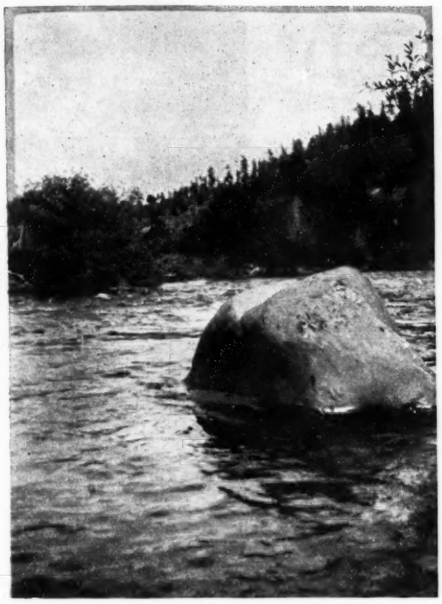
Friends in Need

While trailing in the Rockies on our last trip we met with an incident which always shall remain fresh in our memories as an earnest of the flowing milk of human kindness which makes some so different from others. We were in the heart of the mountains, at an elevation of some 9000 ft., having a most glorious time in the perfect climate prevailing in the greatest playgrounds in the world. While shifting camp grounds we broke a pinion gear tooth. Now of itself this is not a serious affair when you know your car, so I hurried on foot to the nearest telephone and ordered a pinion from Denver. As the agent there was out of this gear he ordered one from the factory and forgetting the trouble it would cause changed my orders to send by parcel post, instructing the factory to send by express.

Days passed as we waited for the gear, and what at first was only a laughable incident became an annoying event, threatening to change our entire plans on account of the delay. A long distance call or



A Packard rebuilt into a traveling camp, or bringing the trailer home to the car and giving it a private suite—one of many equipment-carrying devices



From several of these pleasing spring-fed streams Denver gets her water supply—Platte Canyon, Colorado

two to Denver soon put the district telephone man on to the fact that there was trouble along the line. His station was many miles back in the mountains, far from the railroad and in one of those lonesome spots which seem to be a good crossing place for mountain trunk lines and nothing else. Sensing my trouble, this stranger took matters in hand and telephoned along the railroad to points where the package might have been sent and found it at the end of the line in charge of a station agent who was also expressman. No amount of persuasion would induce him to send the package, which had $10 worth of charges attached, back to the crossing where we were. For me to take train to the village meant a day's delay, and the stranger at the telephone seemed to divine all this, so informed the telephone girl at the end of the road to pay the charges personally and he would reimburse her.

When Strangers Aid

This done, the much-hunted package with its precious gear was sent speedily back down the road and thrown off at our crossing. Having arranged all this while I "listened in," my friend in need informed me that he hoped I would find everything all right and would I be so kind as to mail him a remittance at my convenience for the charges he had paid for me—and that from a perfect stranger in a land where roads are scarce and railroads far apart. You may rest assured that we made it our business to drive over the mountain trail that led past his lonely station and add a handshake to our thanks for an act of kindness which shall not be forgotten soon. With a modesty and embarrassment typical of your true westerner he declined to admit having done anything out of the ordinary.

Some time afterward I told this story to an official of the American Telegraph & Telephone Co. and added my conclusion that the telephone companies of this day were public servants in more ways than one. I was informed that the great organization which controls the majority of the telephone systems of the continent steadily has trained the rank and file of its employees to extend to the public they serve the maximum courtesy and aid. While hardly suggesting that telephone offices and operatives may be relied upon to do a credit banking business, as in this case, my own experiences have proved that the telephone companies always are willing to lend first aid of any kind whatsoever to tourists. Should you find yourself in any predicament where a telephone office would aid you, do not hesitate to ask them. We had a further illustration of this while crossing Kansas with our friends trailing some miles behind us with their Ford and trailer. We were an hour or two ahead of them and naturally were ignorant of their delay due to a broken coupling, an injury sustained while crossing a high "thank-you-mam." Our friends telephoned ahead to a town 30 or 40 miles in advance and asked the telephone operator to station a look-out for us, giving a description of the car and trailer. This was done, and we had just arrived at a gasoline station in the town when a boy apprised us of the long distance message. Not only did we get this message, but we were called a few minutes later to talk to our friends, who had started from the scene of their accident, had reached the next town and took a chance of calling us for a personal talk about our point of camping for the night.

THOUSANDS MOTOR TO DUNES

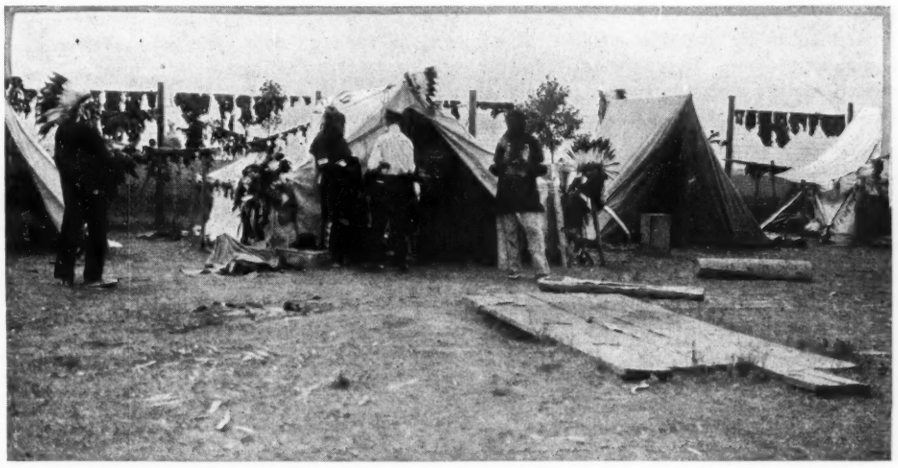
Port Chester, Ind., May 27—Thousands of motorists have driven to the sand dunes of this region during the last few weeks, some of them to watch the rehearsals for the pageant to be given Decoration Day and next Sunday, others to take part in the rehearsals. To-day 1000 persons are here for rehearsal, the Indians, Spanish swashbucklers and wood nymphs who are to appear on the great day mingling together. Spectators dot the hills all about the scene of the activities. They came by motor cars from Chicago, Gary and neighboring towns. The object of the pageant is to save 30 miles of beach, as well as the wonders of the dunes, for a national park. The roads in this section already have made the dunes a favorite with the motorist.

WILL HOLD USED CAR SHOW

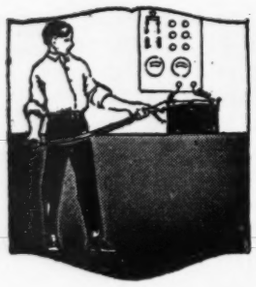
Detroit, May 28—The Detroit Auto Dealers' Association will stage a used car exhibit and sale June 9-16. The dates allow the exhibit to be opened to the buying public on two Sundays. No car will be exhibited that is not equipped with electric lights and starter. Finish and tires must be up to a high standard and the association reserves the right to pass on all cars exhibited. The exhibit will be held in the Crosstown garage, which is in the center of the city, and will house 300 to 350 cars. Each car will bear a tag telling the year and model and giving a general description of its condition and the price. Cars which have been sold will be removed twice a day, and dealers will have the right to replace these cars. Electric cars will be displayed in addition to gasoline passenger cars and if space is available trucks and delivery cars will be exhibited.

SAXON PATHFINDER ON COAST

Detroit, May 28—On inauguration day, March 4, a Saxon car started from Washington on a pathfinding trip for the national boundary highway. The car is supposed to run around the outside boundaries of the United States on the north, south, east and west sides. To date it has traveled the entire south and has turned north on the Pacific Coast to cover the western boundary. This is a stock model Saxon carrying two drivers and their baggage. To date it has given an average of 26 m.p.g., according to the Saxon company. The trip is expected to take five months.



A road-side Indian camp comes along once in a while and adds further variety to a life that never gets monotonous—that of trailing a trailer



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the forty-fifth installment of a weekly series of articles begun in MOTOR AGE *issue of June 29 designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.*

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems, and the relations of current pressure and resistance were brought out. This was followed by an explanation of series and multiple circuits, how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was considered. A section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and the best methods of charging them. Magnets and electromagnetism then were considered, and the principles of generators and motors explained.

Part XLV—Switches and Protective Devices

A GROUNDED switch is one in which no attempt is made to keep both terminals of the switch insulated from the frame of the car, and in fact one terminal is connected purposely to the switch housing or car frame. A switch of this kind is shown in Fig. 257.

An insulated switch is one in which both terminals of the switch are insulated from the switch housing. A switch of this kind is shown in Fig. 258.

Control and Location of Switches

Switches may be classified conveniently according to the means employed in operating them into the following groups:

Manually operated.

Electrically operated.

Combined manual and electrically operated.

In the case of the manually-operated switch the opening or closing of the switch, or perhaps both operations, are performed by the movement of a lever, pressing a button, pulling or rotating a handle, etc., which is usually within easy reach of the driver of the car. The switch itself may be mounted directly with the controlling handle, button or knob, or it may be mounted in some more advantageous positions so far as the electrical circuit, of which it is a part, is concerned and the operating movement transmitted to it by suitable mechanical connections such as rods, chains and levers. It is especially desirable to locate the starting switch for the motor in such a position that the connecting leads to and from the switch will be as short as possible, and still have the switch within easy reach of the driver when he is in the driver's seat.

A manually-operated switch which is operated by a rod is shown in Fig. 249. The gear-shifting lever in this case is used in imparting the necessary motion to the rod controlling the switch. An extra position is provided for the gear-shifting lever, and when in this position all the gears are out of mesh and the lever is connected to the rod R, which is connected by the second rod or link L to the lever of the switch. The rod R serves the double purpose of operating the switch and meshing the motor pinion G with the teeth on the edge of the flywheel. When the

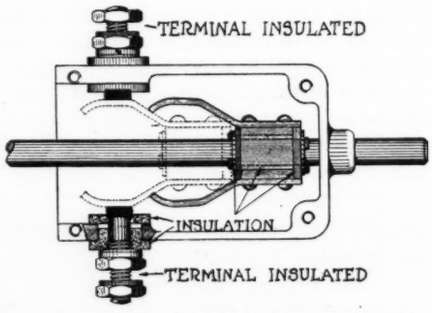


Fig. 258—Insulated switch. Both terminals are insulated from the switch housing

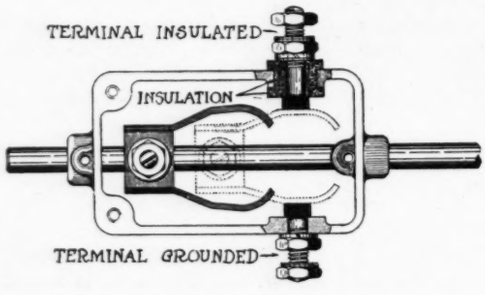


Fig. 257—Grounded switch. One terminal is connected to the switch housing

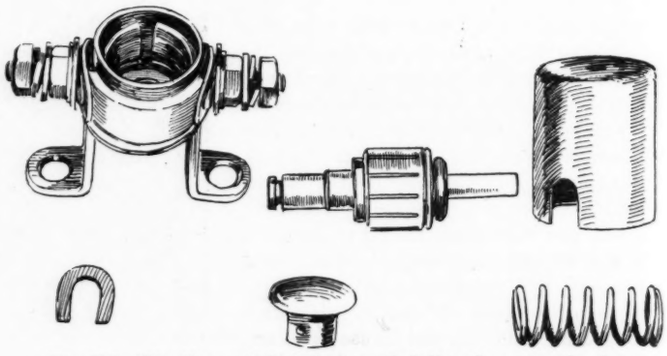


Fig. 259—Starting switch to be mounted directly under the floor board in front

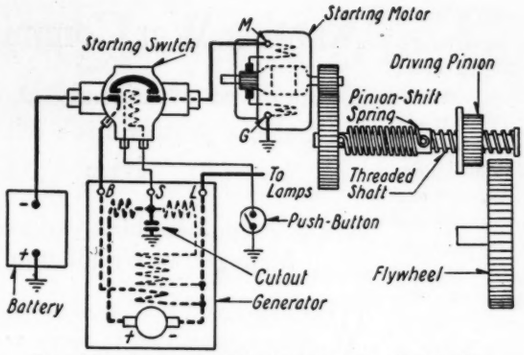


Fig. 260—Diagrammatic drawing of electrically-operated switch

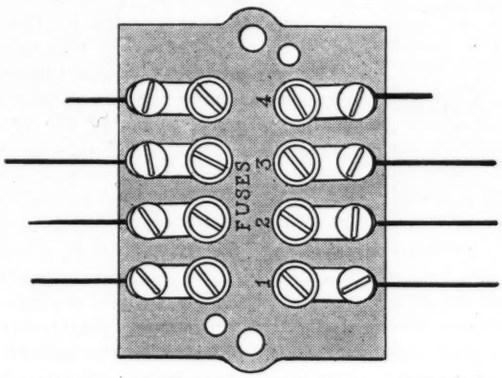


Fig. 261—Fuse block for link fuses as used by the Remy company

pressure is removed from the gear-shifting lever it will be restored to its neutral position, due to the action of the spring S. The motor-starting switch, shown in Fig 259, is intended to be mounted directly under the floor board in front, or within easy reach of the driver, and the button is mounted on the upper end of a rod which extends through a hole in the floor board.

In the case of an electrically-operated switch, the movements of the switch are controlled by electromagnets, which may be energized by closing a small switch within easy reach of the driver. This small switch completes the circuit from the storage battery through the winding of the electromagnet. The principle of a switch of this kind is shown in Fig. 260. Closing the push button switch completes the circuit from the grounded side of the battery, which in this case is the positive terminal, through the winding of the electromagnet in the starting switch and finally back to the negative terminal of the battery.

In some cases the manual and electrical means of control are combined. A very good example of a switch of this kind is found on the Overland car. In this particular case the manual operation of the starting switch cannot be performed unless a certain electrical operation has been performed previously, which serves to release the switch and permit the manual operation.

Fuses and Circuit Breaker

The primary object of a fuse is to provide a weak spot in an electrical circuit, which will be destroyed when the current the circuit is intended to carry becomes abnormal and thus open the circuit, and perhaps prevent serious damage to valuable equipment. The ordinary link fuse consists of a piece of wire made from metal having a relatively low melting temperature. This piece of wire is connected in series with the circuit, usually by placing its two ends under the heads of two flat-headed screws. These screws form the terminals of the gap in the electrical circuit in which the fuse is to be introduced. A typical fuse block for link fuses, as used by the Remy company, is shown in Fig. 261.

In the inclosed type of fuse the fuse wire is incased in a glass or fiber tube, and this tube is provided with metal ends, as shown in Fig. 262. Special clips are provided for accommodating fuses

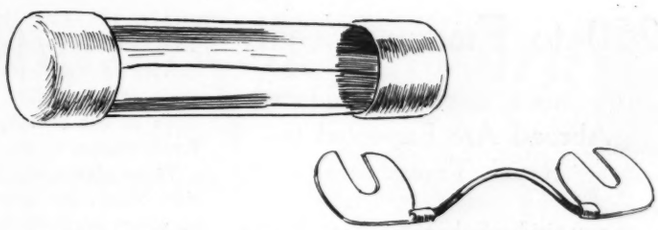


Fig. 262—Inclosed type of fuse wire, incased in glass, left, and link fuse, right

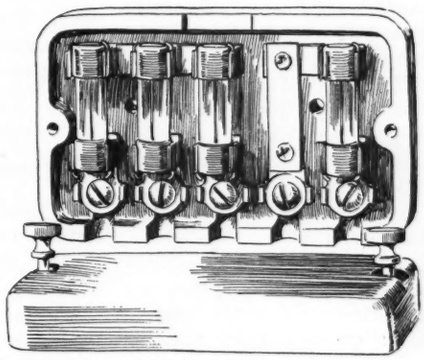


Fig. 263—Special clips for accommodating inclosed type of fuse

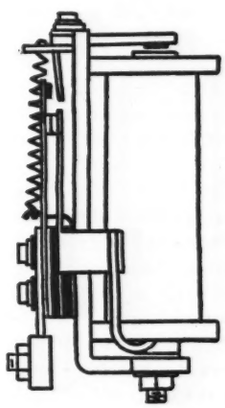


Fig. 264 — Circuit breaker as used by the Delco company

of this kind, as in Fig. 263, which shows several of them mounted side by side.

The circuit breaker is a protective device which serves to open the electrical circuit in which it is connected without destroying any part of the device itself, thus not necessitating any replacements. The operation of a circuit breaker, as used by the Delco company, may be explained by reference to Fig. 264. The circuit breaker winding produces a magnetic pull on an armature when carrying a current, which controls a set of contacts in the main circuit. If the current in the winding of the circuit breaker becomes excessive, due to any cause, such as a ground or short circuit, the armature will be drawn toward the core of the electromagnet and the contacts broken, which results in the circuit being opened. As soon, however, as the circuit is opened the magnetic action on the armature ceases and it returns to its original position, thus closing the circuit again. This cycle of operations is performed quite rapidly and results in a sound quite similar to that of an ordinary buzzer. Such a sound is an indication that something is wrong with the system, and an investigation should be made.

250 to France Weekly

Ambulance Service Volunteers Abroad Are Expected to Reach Thousands

Communities Subscribe for Necessary Expense of Unit

WASHINGTON, D. C., May 25—The American Motor Ambulance Field Service in France is sending on an average of 250 volunteers to France each week, the volunteers being divided into units of twenty-five each. The field service is headed by A. Piatt Andrew, former assistant to the Secretary of the Treasury, who has his headquarters in Paris. Nearly all these volunteers are drawn from the colleges of the country, and each one must be able to drive and repair a motor car.

While expert knowledge is not required some practical experience is essential, and those who volunteer are given several week's practical experience in building Ford cars in some school, garage or factory, before sailing. The service uses Ford cars exclusively in the field.

About 800 such volunteers are now in France, and it is believed that the number which is sailing week after week soon will increase the total to several thousands. The age limit is from 21 to 35 years, and the minimum enlistment is for six months. Each volunteer must pay his own expenses and deposit approximately $350 before being accepted.

Various communities are furnishing money with which to purchase field ambulances for use in France at the front by units which go from these communities. A unit in France is made up of sixty men with 50 ambulances for each unit.

In St. Louis, for instance, around $50,000 was raised by citizens to purchase ambulances for the use of the units going from that city, and the unit also was provided with special Pullman cars from St. Louis to New York. It is understood that localities all over the country which have furnished units for this service contributed very generously towards the purchase of service ambulances. Each ambulance costs $1,600.

BUTLER LEAVES HESS

New York, May 29—Special telegram—Charles S. Butler, for more than six years advertising manager of the Hess-Bridght Mfg. Co., Philadelphia, has resigned to become sales manager for the Carlson-Wenstrom Co., Philadelphia, which is shortly to put on the market a high-grade double row ball bearing.

G. M. TO MAKE TRACTORS

New York, May 25—Tractor production on an extensive scale is being planned by the General Motors Corp., which has added the Samson Iron Works, Stockton, Cal., turning out about eighteen tractors a week. The new interests plan to enlarge the facilities of the Stockton plant and erect three other similar plants in various sections of the country, which will be ready for operation by the early spring of 1918.

These plants will be located, one in Pontiac, Mich., one near Kansas City, and one at some point on the Atlantic Coast, the location of which is yet to be determined.

By next October, General Motors will be producing fifteen tractors a day. By the time the new plants are finished, tractor production is expected to reach sixty a day. The Samson tractor is known as the sieve wheel tractor, the large drive wheels being of the Webb pattern, which does not pack the ground.

Ministry Accepts Ford

DETROIT, May 25—The English ministry of munitions has adopted in entirety Ford's tractor and is asking all manufacers concerned to operate loyally in manufacturing the standardized products. Ford's engineers are under the direction of Charles E. Sorensen, who is issuing blueprints to the different manufacturers with instructions to begin work on tractor production immediately. The war agricultural committee recommended the adoption of the Ford tractor after testing it a week continuously, day and night.

CORNELIUS VAN DYK DEAD

Rutherford, N. J., May 24—Francis Cornelius Van Dyk, president of the Rutherford Rubber Co., maker of Sterling tires, died May 21. He was 79 years old and was born at San Juan, Porto Rico. Up to the time of his death he was president of eight land companies and was interested in silk manufacturing. He was president of the South Scranton Throwing Co., vice-president and director of the North Jersey Title Insurance Co., Hackensack, and vice-president and director of the Second National Bank of Paterson for many years.

KENT CALLED A BANKRUPT

Bellville, N. J., May 25—Two involuntary petitions in bankruptcy have been filed again the Kent Motors Co. Both petitions charged insolvency nad place the company's liabilities at $30,000. Both further allege that the concern has committed acts of bankruptcy in that it made preferential payments and disposed of assets within four months of the filing of the petitions. The company was incorporated in September, 1916, with capital stock of $200,000.

KLEIN RETURNS TO DIRT TRACKS

Detroit, May 25—Arthur Klein will return to the dirt track branch of the racing game. He has entered his name for the races at the Michigan State Fair grounds on Decoration day.

Another War Committee

Council of National Defense Selects Automotive Men to Advise

K. W. Zimmerschied to Act as Manager at Washington

WASHINGTON, D. C., May 26—An automotive committee to serve as a cooperative committee under the leadership of Howard E. Coffin, chairman of the committee on munitions of the advisory commission, has been created by the Council of National Defense. It will advise and assist the government departments on all matters involving the use of internal-combustion engines, including the production of motor cars, trucks and ambulances, tractors, motor boats and airplanes. The members are: Chairman, Charles Clifton, president of the National Automobile Chamber of Commerce; C. W. Stiger, president of the Motor and Accessory Manufactures; Coker F. Clarkson, general manager of the Society of Automotive Engineers; Frank H. Russell, president of the Aircraft Manufacturers' Association; H. L. Horning, chairman tractor standards division of the S.A.E.; Henry R. Sutphen, chairman the marine standards division of the S.A.E.; K. W. Zimmerschied, past chairman standards committee of the S.A.E. Mr. Zimmerschied will act as manager of the committee and will be in charge of its office in Washington.

44.6 M.P.G. RECORD

Detroit, May 28—The mileage-per-gallon-test-day held by the Maxwell Motor Co. on May 23, developed some high records. James Lephart, Greenville, Ohio, Maxwell dealer, secured a mileage of 44.6 miles on 1 gal. of gasoline. Other high marks displayed by the reports to the factory are: Moller & Futterer, Quincy, Ill., 40.1; J. L. Alford, Salvisa, Ky., 31.5: J. L. Adams, Rome, Ga., 26.3; Rabbit-Polson Co., Phoenix, Ariz., 35.6; Biever Motor Co., New Haven, Conn., 43.1; R. R. Carroll, 36; George Naipier, Macon, Ga., 44.

KLIESRATH TO LEAVE BOSCH

New York, May 25—V. W. Kliesrath, who has been chief engineer of the Bosch Magneto Co. for many years, and who is as well known in the magneto business as any man in America, has resigned. Mr. Kliesrath has had a very wide experience with the Bosch company, having been directly in charge of the main office and also having control of the engineering and technical department. In addition to handling the motor car end, he has handled the motor boat and aeronautical work as well. At present Mr. Kliesrath has no plans for the future further than a short vacation.

From the Woman's Viewpoint

How Stay-At-Homes Can Help Win War

WHILE so many of our women are turning their attention to giving aid as ambulance and truck drivers, perhaps, some of them are wondering if they will get a chance to serve in this way. There is no doubt that the women of America are as ready to do their part as have the women of Europe proved themselves to be, and if all cannot serve in a motor way, none need think herself of no avail.

The Secretary of Agriculture, Franklin K. Lane, in response to requests from editors for a statement as to service women can render the nation in producing and conserving agricultural products, has issued a statement that suggests further motor service from women and emphasizes the service of the woman who stays at home.

Saving at Home

Every ounce of food the housewife saves from being wasted in her home, all food which she or her children produce in the garden and can or preserve, every garment which care and skillful repair make it unnecessary to replace, all lessen that household's draft on the already insufficient world supplies, he says.

To save food the housewife must learn to plan economical and properly balanced meals, which, while nourishing each member of the family properly, do not encourage overeating or offer excessive and wasteful variety. It is her duty to use all effective methods to protect food from spoilage by heat, dirt, mice or insects. She must acquire the culinary ability to utilize every bit of edible food that comes into her home. She must learn to use such foods as vegetables and milk products as partial substitutes for meat. She must make it her business to see that nothing nutritious is thrown away or allowed to be wasted.

Waste in any individual household may seem to be insignificant, but if only a single ounce of edible food, on the average, is allowed to spoil or be thrown away in each of our 20,000,000 homes, over 1,300,000 lb. of material would be wasted each day. It takes the fruit of many acres and the work of many people to raise, prepare and distribute 464,000,000 lb. of food a year. Every ounce of food thrown away, therefore, tends also to waste the labor of an army of busy citizens.

Clothing is largely an agricultural product and represents the results of labor in mills and factories. Whenever a useful garment is discarded needlessly, material needed to keep someone warm or dry may be consumed merely to gratify a passing fancy. Women would do well to look upon clothing at this time more particularly from the utilitarian point of view.

Leather, too, is scarce, and the proper shoeing of armies calls for great supplies of this material. There are only so many pairs of shoes in each hide, and there is a shortage of animals for leather as well as for meat. Anything that can be done to encourage adults or children to take care of their shoes and make them last longer means that so much more leather is made available for other purposes.

Employed women, especially those engaged in the manufacture of food or clothing, also directly serve their country and should put into their tasks the enthusiasm and energy the importance of their product warrants.

While all honor is due to the women who leave their homes to nurse and care for those wounded in battle, no woman should feel that because she does not wear a nurse's uniform she is absolved from patriotic service. The home women of the country, if they will give their minds fully to this vital subject of food conservation and train themselves in household thrift, can make of the housewife's apron a uniform of national significance.

He might have added, if he had gone further into detail, that food conservation opened another field for the woman driver. Even as the European women are driving the ambulances in the Red Cross service, so are they driving the trucks that carry the market vegetables to the stores, the trucks that deliver the goods of the department store and that deliver garden produce from house to house.

Blighty the Pup on Motor Duty

BLIGHTLY is the name of the pup that belongs to the women who are ambulance drivers in the American unit of the Red Cross serving the Allied armies in France. He has been under fire several times, as have the women who drive the machines for which he is mascot.

There are many ambulance drivers at the front now, it seems. Canada has sent quite a few, and the Canadian women are as steadfast in the severe work as their sturdy cousins from England, who find it great sport to be driving an ambulance or some official's car instead of doing the prosaic duties of a ribbon counter.

Mrs. Celia F. Parry is said to be the only licensed woman cabby in the city of New York. Her license permits her to drive anything that eats hay or runs on wheels

Would You Think Hats So Floppy?

WORD comes from Pittsburgh that motor car accidents are increasing there. Of course, the increasing number of cars explains part of the accidents, while the extreme youth of drivers explains others. But Pittsburgh has an unusually large number of women who drive, and here comes, according to the Pittsburgh Press, the public safety director of that city to say hats are responsible for many of the women's accidents. He says that:

Of the 2489 accidents in Pittsburgh last year a few were attributed to women, and several of these could have been averted, according to records in his office. There were 121 deaths from motor car accidents in Allegheny County during the same period.

There are many causes for accidents to cars that are driven by women. In some cases they become excited when they should be calm, sometimes they misjudge distances, do not heed traffic rules and are otherwise responsible for accidents. These same things happen to men motor drivers, of course, but there is still another reason peculiar to women who drive—hats.

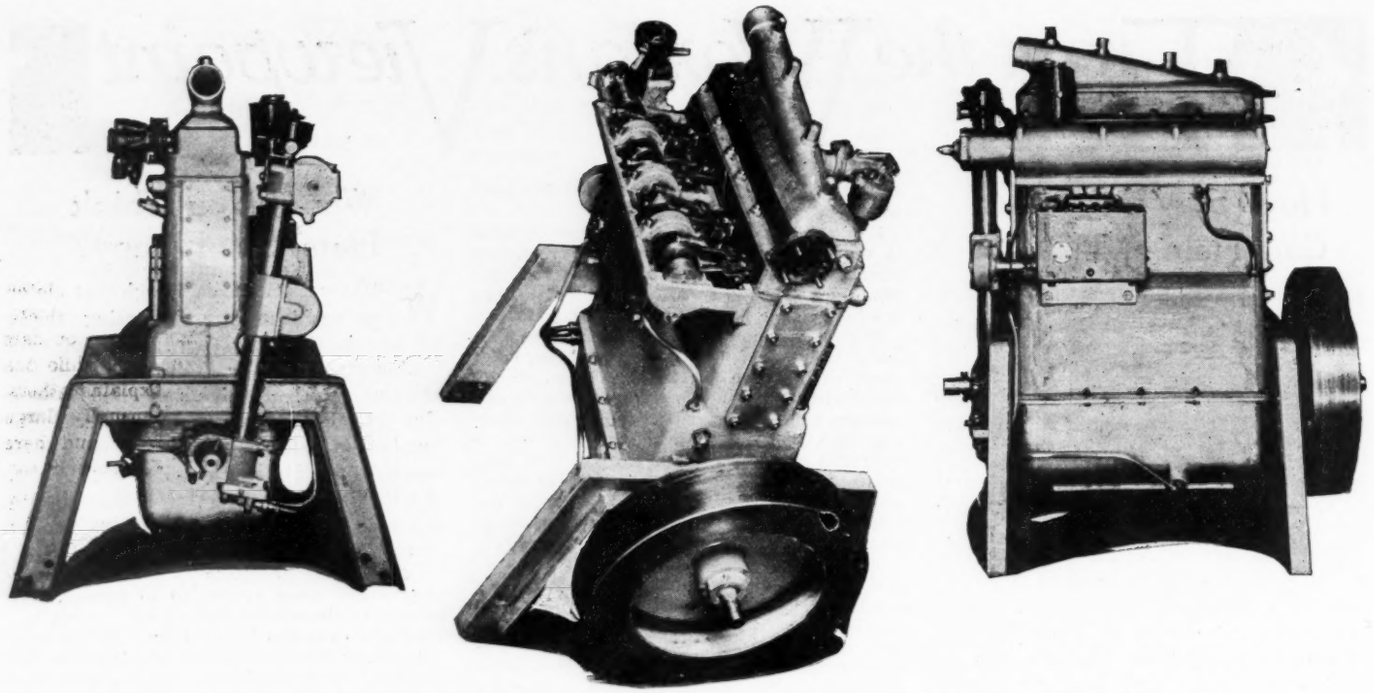
Each year more women are seen driving cars. Most of them are attired in correct driving costume, which gives them free use of their arms and enables them to dodge in and around streams of traffic and people in a way that seems little less than marvelous.

Large hats are a great handicap when driving a motor car, particularly on windy days. For this reason many women wear tight fitting caps which defy the wind. This gives a freedom of the arms to drive their cars. Women wearing hats which flap about their heads at the least gust of wind instinctively release their hold on the steering wheel and grasp the headgear, leaving the car to run unguided. Large, flappy hats have been the cause of many accidents to motor cars driven by women.

Other causes for accidents are careless drivers, old people whose heart action is such that it fails them in time of emergency and very youthful drivers who do not possess sufficient developed mental faculties.

Women of Chicago to Give Ambulance

A GROUP of Chicago women who have been taking a course of motor training has launched a movement to buy an ambulance and place it at the disposal of the War Department, either here or somewhere in France. The women have been fitting themselves to be ambulance drivers. A recent report from Paris to the effect that the men who drive ambulances might be replaced by women to enable them to give other service has brought the likelihood of their doing so a little closer home. For it is said that French women already are working to capacity in the munitions plants and industrial lines and could not man the American ambulances.



Three views of Mohler slide-valve engine, the view at the left showing the camshaft and oiler-driving shaft, at the center the piston valve re-operating mechanism and at the right the auxiliary oiler fastened to the side of the engine

Slide-Valve Engine Properly Lubricated

Auxiliary Oiler Obviates Usual Difficulties

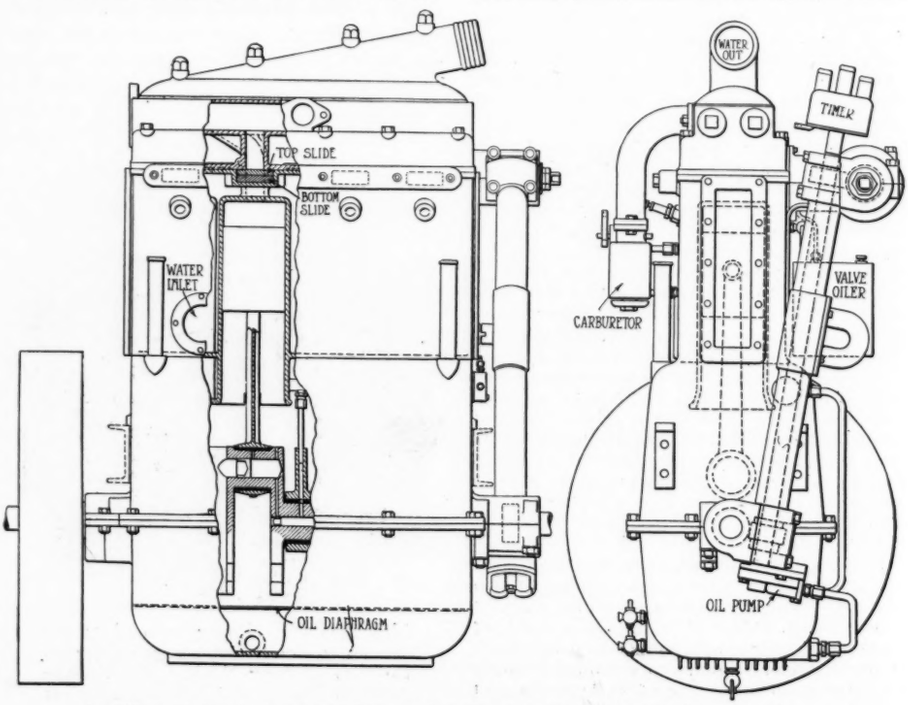
A SLIDE-VALVE engine which has proved itself under vigorous tests at the Armour Institute of Technology, Chicago, to be capable of sustaining high speed with perfect lubrication of the slides is the invention of and has been constructed by A. B. Mohler, Mexico City. The experimental engine with which the test was made is now in the hands of R. M. Byers, president of Byers Bros. Co., Union Stock Yards, Chicago.

As the cross-section will show, the slides are actuated by a series of pistons carried on a shaft within a separate casting which is bolted to the side of the engine. This shaft is worm driven from another shaft which extends on a slight angle to the front of the crankshaft from whence it is in turn worm driven.

The slides actuate one on top of the other, and upon their location depends whether the intake or exhaust ports are uncovered or whether both are closed. The previous objection to overhead-slide-valve engines seems to be completely obviated due to an ingenious and simple method of oiling.

Instead of relying on crankcase oil for the overhead system there is a distinct unit employed which consists of a Detroit oiler bolted to the side of the cylinder casting. This is a mechanical oiler and is driven from the shaft which extends from the crankshaft to the camshaft, by worm gears. There is one dripping valve for each set of sliding valves, and these drips are set to give about one drop per 1000 r.p.m. of the engine. The oil is conducted directly to the top of the slide as shown in the cross section of the head. The top slide is grooved with a small drilled hole through one end of the groove through which the oil passes to the bottom slide, keeping both surfaces covered with a film of oil.

To further insure positive action of the slide valves they are completely surrounded by cooling water. That this factor is not essential, however, was brought out when, in a block test before a MOTOR AGE representative, through oversight the cooling water was not turned into the engine. The engine was run at high speed for approximately 10 min. before this fact was noted, and examination proved that



Side and front view of Mohler engine showing section of cylinder assembly

the valves were unharmed, in fact the engine was not even tight.

The experimental engine has a bore of 3½ in. and a stroke of 5½ in. The valve openings were made especially small for experimental purposes, being but 1⅛ by ⅝ in. with the result that there are no valuable figures of the possible horsepower output of the engine. The design is such that these valve openings can be nearly doubled in size.

Due to an ingenious manifold construction the engine will accelerate cold from its lowest idling speed to over 3000 r.p.m. without choking. This was demonstrated to the MOTOR AGE representative. Much of this ability is due to the fact that the design of the ports or rather the location is almost ideal in the matter of volumetric efficiency. The combustion chamber is unbroken except for the spark plug depression and small ports to the valves. These valves are located at the top of the combustion chamber so that the gases have a straight-line entrance and exit.

Pre-heating the Gas

Another factor tending toward the ability to accelerate rapidly is the hot spot within the intake manifold. The manifold is within the cylinder head and is bounded on one side by the exhaust manifold. Upon entering the cylinder the gas is thrown violently against a hot spot, which is a thin wall of cast iron separating the intake and exhaust manifold.

This serves to pre-heat the gas and because of the fact that the intake manifold is bordered by the exhaust manifold the gases are quite sure to remain well heated during their course to the cylinders.

The pistons operating on the camshaft are similar to those employed in the Knight-type engine with split bearings which are readily adjustable. In this camshaft assembly is another unusual feature in the form of a friction clutch which will throw the shaft out of action should any of the valves become stuck.

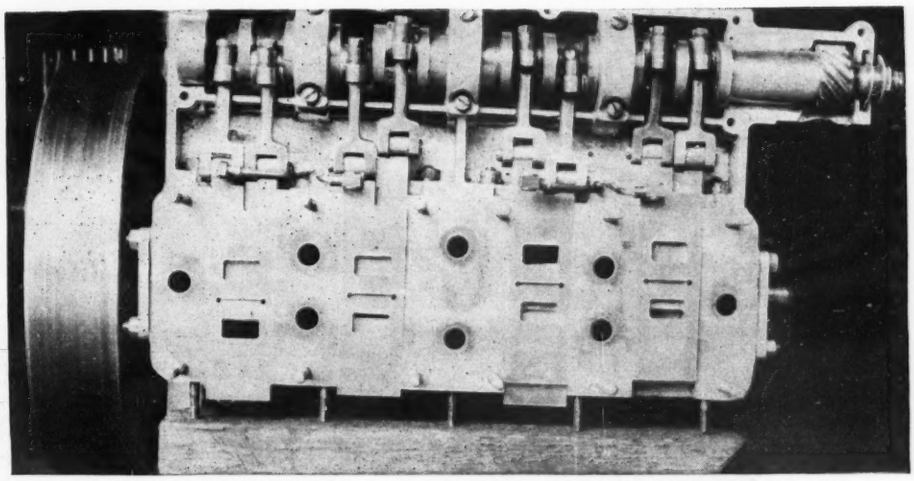
This is a simple friction disk employed in the end of the shaft. If anything goes wrong in the valve mechanism the disk slips and throws the engine out of time with the result that it stops. The matter of retiming the engine is a moment's work of loosening a nut, matching up a couple of marks and tightening the nut again.

Aluminum pistons are employed and the crankshaft is counterweighted. This, coupled with the commendable method of intaking and exhausting the gases makes an engine speed of 3000 r.p.m. a possibility even with the small valve openings in this experimental model.

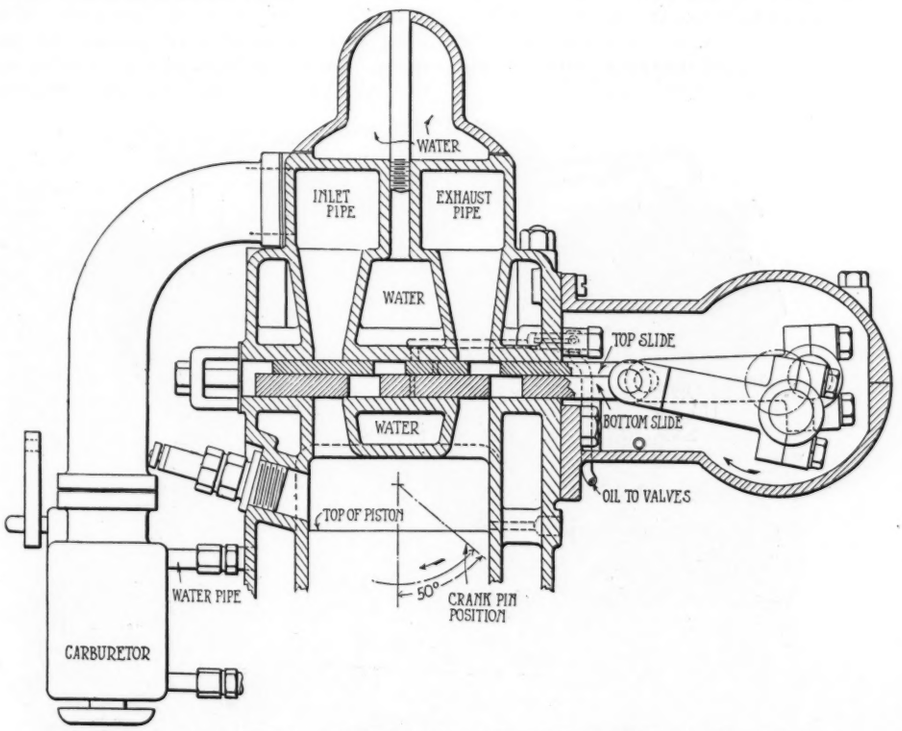
Timing is quite conventional, the exhaust opening 55 deg. before bottom center and closing 12 deg. past top center, and the intake opening 10 deg. past top center and closing 40 deg. past bottom center.

The crankshaft bearings are large for a four-cylinder engine of this size, the dimensions being as follows:

Front	1⅝ in. by	2⅜ in.
Center	1⅞ in. by	2 in.
Rear	2 in. by	3¼ in.



Looking down on the slide-valve assembly of the Mohler engine. Note that two of the ports are open



Section through top part of Mohler engine. The piston is shown on the explosion stroke with both ports closed

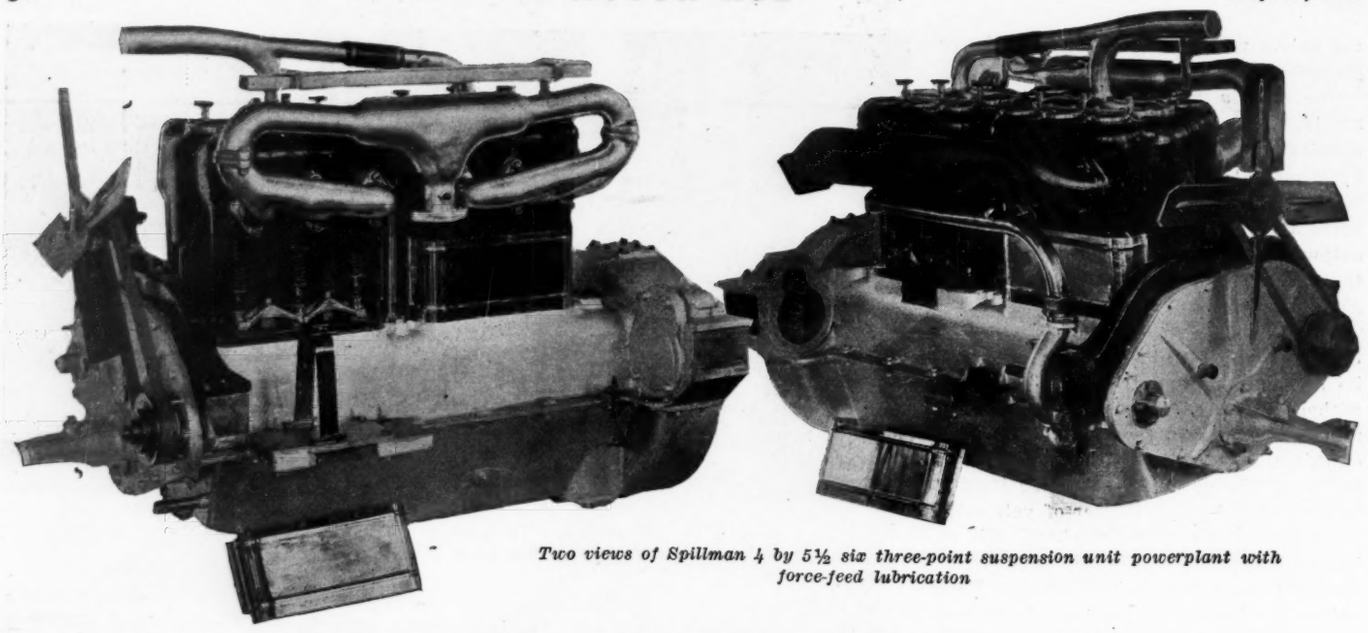
AMES TO INSURE EMPLOYEES

Owensboro, Ky., May 25—The F. A. Ames company and allied corporations, manufacturers of motor car bodies and the Ames-ton truck, have inaugurated a system whereby after an employe completes a year of continuous service the sum of $250 will be paid to his family in event of his death. Smaller amounts are to be paid to him if a member of his family dies. The death benefit payable to the family increases at the rate of $50 per annum during the continuous service of the employe. At the end of the sixteenth year of continuous service the employe is given a policy for $1,000.

All expenses of the plan are to be borne by the Ames company. The policies are made payable to the company, and disposition of the funds upon the death of the employe is supervised by the corporation acting as a legally constituted trustee. The plan is made retroactive to cover a period of twenty years. It directly affects 195 men at the present time. Nine of these are now entitled to receive their policies for $1,000.

RACING COMPANY INCORPORATED

Detroit, Mich., May 25—The Super Six Racing Co. has been incorporated with a capital of $1,000. Incorporators are Arthur J. Hill, W. H. Chandler and E. A. Shelbreak.



Two views of Spillman 4 by 5½ six three-point suspension unit powerplant with force-feed lubrication

Herschell-Spillman Builds Three Engines

AN EIGHT, a six and a four are now provided by the Herschell-Spillman Co., North Tonawanda, N. Y. The complete line is designed to provide for practically all types of cars.

The eight cylinder, known as the model V, is the block-cast type with semi-steel cylinders. The inlet pipes are integral with the cylinder castings with the exhaust pipes bolted on. There is an unusual amount of water space in the two blocks of this engine. The cooling water is taken into the cylinders at the lowest point in the water chamber and emits directly over each exhaust valve. The crankcase is an aluminum-alloy casting with ribs for bracing. There is a standard S.A.E. bell housing cast integrally with this crankcase.

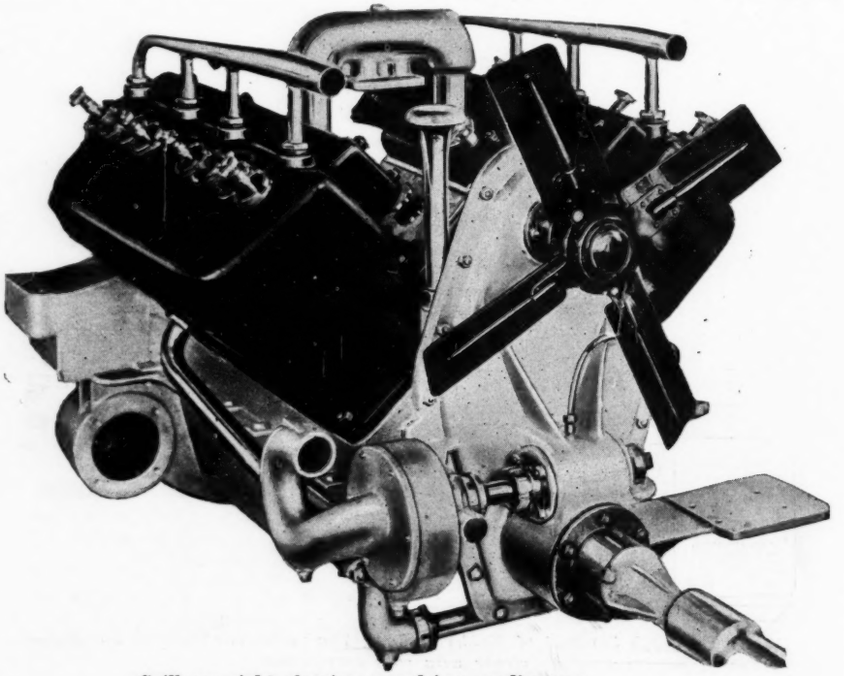
The engine is furnished in two sets of specifications, one type having a bore of 3 and the other of 3¼ with a 5-in. stroke for both. The two sizes give formula ratings of 28.8 and 33.8 respectively.

Cylinder Blocks Staggered

The pistons are gray iron castings fitted with three $\frac{3}{16}$-in. rings all above the wrist pin. The pin itself is seamless steel tubing. The connecting-rods are conventional I-beams with two bolt caps running side by side on the crank pin, this construction being distinguished from the more common practice of using a yoke and double concentric bearing in the lower end of the rod. With the side-by-side arrangement of the connecting-rods it is necessary to stagger the cylinder blocks $1\frac{9}{16}$ in. or an amount corresponding to the width of the big end connecting-rod bearing. These rods are made from high-carbon steel and are drop forgings giving relatively light weight with maximum stiffness and rigidity.

The Herschell-Spillman six and four are conventional L-head types. The four cylinder engine is an up-to-date type of high speed design having an S.A.E. rating of 16.9 from its 3¼ by 5-in. cylinders, and capable of developing, according to the brake test, from 36 to 38 hp. This is the latest product of the Herschell-Spillman Co. and is a block-cast design with the gas and water inlets in the cylinder. The inlet and exhaust manifolds are cast integrally with each other and bolted to the cylinders. The valves are surrounded by water passages, with water passing entirely around each of the cylinders. In this engine the crankcase is cast integrally with the cylinders, with the standard S.A.E. bell housing bolted to the crankcase. The oil pan is a steel stamping bolted to the crankcase and readily removable.

The pistons are cast from gray iron and have three $\frac{3}{16}$-in. rings above the wrist pin, as in the eight-cylinder engine. The wrist pin is of seamless steel tubing, hardened and ground, and is clamped in the piston by means of a set screw. The connecting-rods are high carbon drop forgings of I-beam section, with two-bolt lower bearing caps. The bearings are die-cast babbitt on the lower end and phosphor bronze in the piston ends. The crankshaft has two main bearings and the shaft itself is high carbon steel, heat treated, machined and ground. Low carbon steel is used for the camshaft. The cams are integral with their surfaces carbonized and ground to shape. The camshaft is supported on three bearings with the cam shaft so arranged



Spillman eight showing gear-driven cooling pan

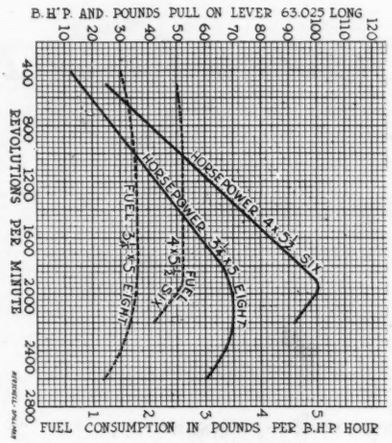
as to give quick opening. The valves are 45-deg. poppet types of nickel steel.

Lubrication is by force feed to the main crankshaft bearings, camshaft and pump shaft. The upper and lower rod bearings and the cylinders are taken care of by splash. An overflow valve is arranged by means of which oil is led through a tube to the timing gears.

Either magneto or battery may be used for ignition, and cooling is by thermo-syphon. As will be noted, the general characteristics of this engine are quite similar to those of the Herschell-Spillman V eight-cylinder engine.

Lubrication is by pressure feed, the oil being drained from the oil pan by a positive-driver gear pump through a passage extending lengthwise of the case to the crankshaft main bearings under a pressure of from 10 to 50 lb., corresponding to the speed of the engine. From this passage the oil is taken to each of the main bearings and thence through the hollow crankshaft to each connecting-rod bearing. From the lower connecting-rod bearing the oil passes up through a tube in the connecting rod to the wrist pin bearing and cylinder walls. The oil passage in the crankcase is also connected with the three camshaft bearings.

A feature of the oiling system is the adjustable safety valve which is placed in the oil line at the left side of the engine. This maintains the proper pressure in the oil feed and the overflow from it is conducted by a tube to the timing gears. Oil retainers are placed at several points in the crankcase so that a maximum amount is returned to the oil pan to be strained and circulated by the pump.


B.H.P. AND POUNDS PULL ON LEVER 63.025 LONG
10 20 30 40 50 60 70 80 90 100 110 120
400 800 1200 1600 2000 2400
REVOLUTIONS PER MINUTE
HORSE POWER 4½-5½ SIX
HORSE POWER 3½-4½ EIGHT
FUEL 3¼-4½ EIGHT
FUEL 4-5¾ SIX
1 2 3 4 5
FUEL CONSUMPTION IN POUNDS PER B.H.P. HOUR

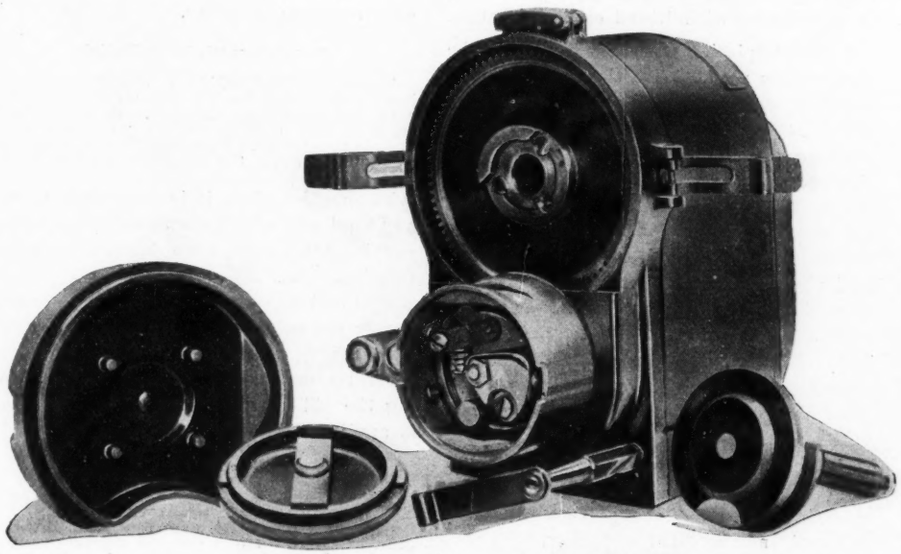
Power curves of Herschell-Spillman sixes and eights

Cooling is by pump circulation, with the water pump mounted on the cross shaft and driven by spiral gears at the front end of the engine. The pump is of double construction so that circulation is given to each separate cylinder block. The cooling fan is five-bladed and made of pressed steel. It is gear-driven and provided with a friction damper to eliminate the effects of inertia in starting and stopping. Arrangements are made to attach the tire pump to the rear of the fan shaft between the cylinder blocks.

Practically any type of starting motor can be installed on this engine because of provisions made for it in the right supporting arm. A bracket is also cast on the front gear case cover for installation of a lighting generator. This is driven through a flexible coupling by the cross shaft which operates the water pump.

Berling Line of Magnetos

THE Ericsson Manufacturing Co. of Buffalo, N. Y., is puttin gout a line of magnetos which is rapidly increasing as stock equipment for both American and foreign vehicles, as well as for the requirements of aeronautic service. There are three basic types of magneto made by the Ericsson company, all under the name of Berling. These are: A single spark unit intended for cars and trucks, a two spark type for high-duty requirements such as airplanes and passessenger cars; and a motorcycle type.



Berling type E magneto partially disassembled

The Berling type D, two-spark independent, and the type DD, two-spark dual, have been designed for heavy-duty four, six and eight-cylinder models, in which the charge in the cylinder is ignited simultaneously at two separate spark plugs. The capacity of the D and DD types is sufficient to give suitable ignition for engines up to 200 hp. The eight-cylinder types are designed to run at twice crankshaft speed, the sixes at one and one-half times crankshaft speed, and the fours at crankshaft speed. Magnetos of this type are principally required for marine and aeronautic fields, and consequently particular provision has been made in this model of the Berling magneto to inclose completely all the high-tension current carrying parts, thus insuring positive operation under varying climatic conditions.

Where Magneto Differs

The primary difference between the two-spark Berling magneto and the ordinary high-tension type supplying current to one spark only is that in the single spark plug type one end of the armature secondary winding is grounded to the frame of the magneto, from which it is electrically connected to the engine. The other end of the secondary winding is connected with the collector spool. On the Berling two-spark type neither end of the secondary winding is grounded but each is connected to one of the two separate segments on the collector ring.

The distributor mechanism consists of two separate distributor blocks and one distributor finger, carrying two separate distributor brushes, each brush connecting with the segments of its respective distributor block. With this arrangement any two-cable terminals directly opposite each other on the distributor blocks will practically possess an equal electrical potential relative to any part of the body of the engine. The two sparks are secured by one break in the primary circuit and are simultaneous.

For Many Purposes

The type E Berling magneto is intended for a wide range of purposes, including cars, trucks, airplanes and marine fields. It is a high-tension type and a completely inclosed water-proofed unit. The frame is a solid unit to which the drive and interrupter end bearings are fitted, the magnets themselves being entirely covered.

One of the features of the Ericsson magneto is its accessibility. The distributor can be removed by unsnapping the two holding springs on the end. The interrupter is adjusted by loosening an ordinary screw locking the platinum contact in place. The action of the interrupter can be inspected while the magneto is running. The collector brush holder can be removed

(Concluded on page 43)

The Readers' Clearing House

SOMETHING ABOUT TEMPERATURES

No Perfect Method of Showing Explosion Heat

FOWLER, ILL.—Editor MOTOR AGE—Give the prevailing opinion of automobile engineers on the following:

What is the internal temperature of water-cooled engines on the average car under ordinary driving conditions?

What is the internal temperature of air-cooled engines?

What is the probable increase in temperature in racing cars?—Dr. C. C. Haxel.

We cannot answer this by giving any simple temperatures. On ignition, the temperature curve rises rapidly and drops again with expansion, so that an average means nothing at all. The only way that temperatures in an internal combustion engine can be shown satisfactorily is by means of an entropy chart, and these we do not have available. In fact, we doubt if any authentic tests on internal temperatures of gasoline engines are in existence. We only know the heat value of the fuel, and can only calculate on mean effective pressure by means of formulas or diagrams made by the very unreliable indicating devices on the market.

The temperatures can be calculated by formula, according to the equation $\frac{PV^n}{T} = R$ a constant; where P is absolute pressure, V volume in cubic inches, T absolute temperature and N the exponent of expansion, according to abiabatic laws, which in the case of a gasoline engine can be taken as 1.4.

In practice it is impossible to compress air either abiabatically or isothermally. The isothermic exponent is 1, and with the abiabatic exponent at 1.4 it is very probable that the curve of expansion would be somewhere between these two or approximately 1.25 or 1.3. This is what is approximated in the straight single-cylinder air compressors, which may be taken as a typical example when cooling is used.

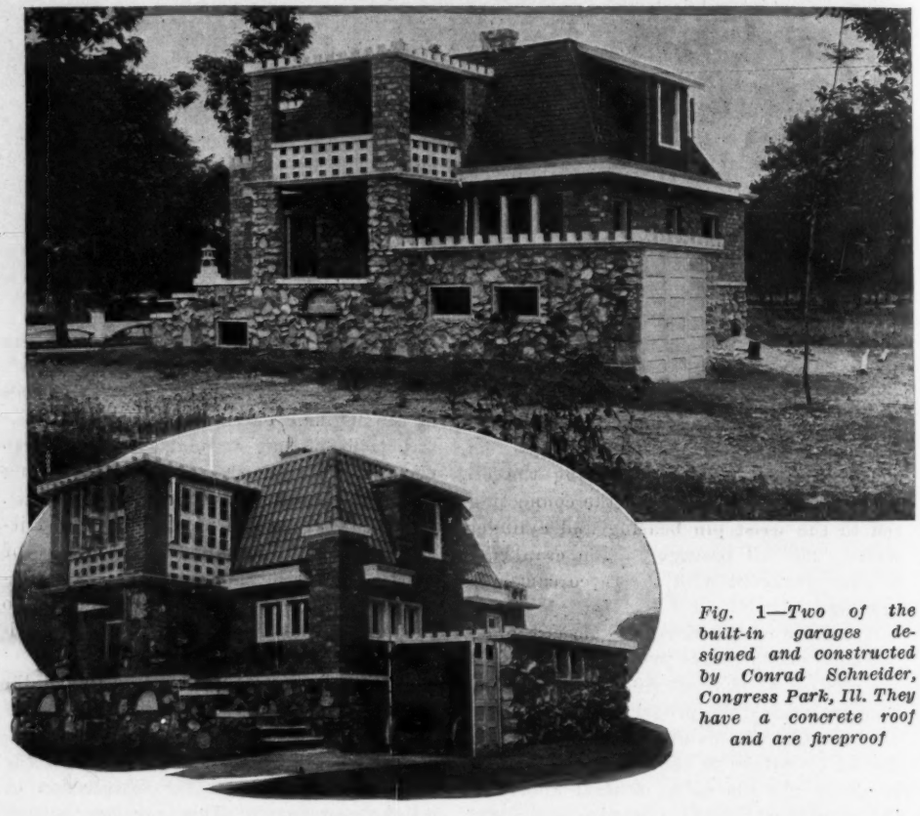


Fig. 1—Two of the built-in garages designed and constructed by Conrad Schneider, Congress Park, Ill. They have a concrete roof and are fireproof

DATA ABOUT NEEDED COMPRESSION

Ready Ignition Obtained From Diesel Type Engine

Eureka, Cal.—Editor MOTOR AGE—What compression pressure would be required to unfailingly ignite (a) ordinary gasoline, (b) alcohol, (c) kerosene, (d) distillate injected into cylinder charged with pure air?

2—What would the resultant explosion pressure probably be in each case? And thickness of cylinder wall to withstand it?

3—Would not additional cooling capacity be required over an engine of equal size with normal compression?

4—Does not an engine of this type require to be turned over several times before self-ignition will take place regularly?

5—Would not the old four-speed transmission with geared-up fourth be particularly desirable for use with the present-day, high-speed motors? I should think on good roads and especially at speeds of 20 m.p.h. or over the fourth would result in economy. Suppose people would abuse it, though, trying to climb hills with it?—A. D. Kellogg.

1—We are not familiar with any research work on compression pressures required to unfailingly ignite the four fuels you mention. It is simply a matter of compressing until the temperature reaches the flashing point of the fuel, although, of course, it is probable that the flashing point will be delayed owing to the pressures. Ordinarily, gasoline will pre-ignite at 120 lb. absolute. With alcohol the pre-ignition compression would be about 250 lb. per square inch, with kerosene about 350 to 400 lb., and distillate 500 to 600 lb. per square inch, in accordance with Diesel engine practice.

2—The explosion pressures vary with the compression used. With the ordinary compression used in gasoline engines the explosion pressure varies around 250 to 300 lb. per square inch, but this is with compression pressures of from 75 to 80 lb. absolute. We do not have available any figures on the maximum explosion pressure when ignition takes place due to compression. Dugold Clerk cites a maximum explosion pressure of 500 lb. per square inch for alcohol, with a compression of 190 lb. per square inch. In the Diesel engines which would approximate the maximum explosion pressures with the distillate, the explosion pressure ranges about 600 lb. per square inch. The thickness of the cylinder wall would depend altogether on a number of other conditions beside the explosion pressures and could not be cited in figures.

3—If ignition, due to compression, was used extra cooling capacity would not be required except to take care of the oil filling.

4—It is not necessary to turn the engine over very much as the compression pressures are generally made sufficient to furnish ready ignition and the compression is done outside of the explosion chamber.

5—It has been found that the geared up fourth is not desirable on account of unavoidable noise. There is no doubt that it does result in economy.

Trouble with Wax Polish

Ephrata, Wash.—Editor MOTOR AGE—We have used a well known prepared wax on our cars for polishing purposes. A gray, hard surface has formed which we have been unable to remove. How can this be removed without harming the original paint?—T. W. Harris.

In the first place it is impossible to use any kind of a polish continually on a motor car body without some kind of a scum forming.

It would appear to us that you have evidently put on coat after coat of wax without cleaning off the old coating. There are several cleaners manufactured for removing the old coating before a new coating is applied.

Ignition Switch on Hupp

Washington, D. C.—Editor MOTOR AGE—The ignition and starting switch on my 1915 model K Hupmobile are combined in one unit. Tell how I can use the regular switch for ignition only and where can I put a switch; also mark the place where an am-

meter can be connected to show the charge and discharge of the system?

I have a great deal of trouble with the switch mentioned above on account of the two circuits being connected in the same switch.—A. S. Barnett.

An ignition switch can be installed by simply cutting in a switch on the battery ignition connection. Unless you use an ammeter registering sufficient amperage for starting current you will not be able to install one on this model, because of the connection of the motor generator, as both starting and lighting current flow over the same wires.

SPLASH SYSTEM IN EIGHT ENGINE

Is Used With Apparent Success in Several Makes

Tonganoxie, Kan.—Editor MOTOR AGE—Is a circulating-splash oiling system practical in a V-type eight-cylinder engine?

2—Will circulating-splash oil all cylinders equally in a V-type eight-cylinder motor providing it has a baffle plate to deflect the spray of oil?

3—Which is the more efficient in a V-type eight-cylinder engine, circulating-splash or pressure oiling system?

4—What is the difference between circulating-splash and a splash-pressure oiling system?—C. J. Harlin.

1—It is used in several V-type eight-cylinder engines with apparently good results.

2—It probably will if suitable troughs are provided under the connecting rods which will then dip into the troughs and spray the oil over the cylinder walls, pistons, etc. The chief disadvantage with the splash systems seems to be that the cylinders do not always receive the same amount of lubrication when a car, for instance, is going up or down a hill. Where troughs are provided in the bottom of the crankcase these objections are overcome to some extent by retaining the oil, even though the engine is on an incline. Where the oil is carried in the bottom of the crankcase, it is also customary to fit baffle plates to prevent the oil from surging.

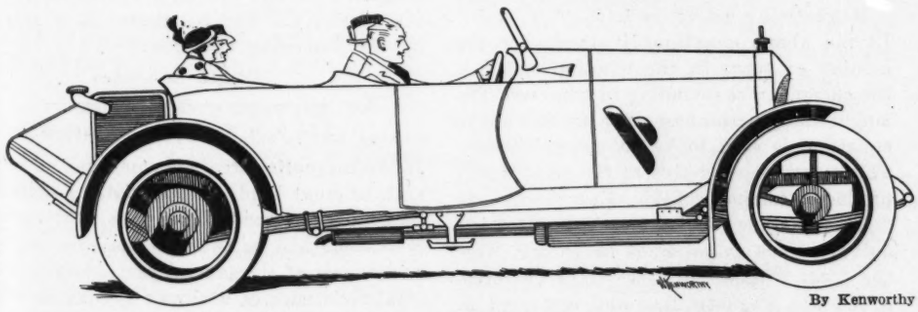
3—The preference among makers of eight-cylinder V-engines seems to be to supply oil to the engine under pressure.

4—Circulating-splash systems are also called "pump over" systems, inasmuch as the oil is used over and over. In this system the oil is carried in a reservoir in the bottom of the crankcase from which it is drawn by a pump through pipes to the main engine bearings. The excess oil from these bearings is thrown by centrifugal force against the cylinders and walls of the crankcase. It runs down from these into troughs under the connecting rods, the latter being lubricated by scoops fastened to the rods. Usually tubes are fastened to the connecting rods which allow the oil to reach the piston pin. The troughs under the rods are fitted with overflow pipes so the oil will return to the reservoir.

In the splash-pressure system of oiling, the oil is forced by a pump from a reservoir to the main bearings, the overflow of which settles in the bottom of the crankcase, and is splashed on the pistons and cylinder walls by the connecting rods, the bearings of the latter being oiled at the same time. This system differs from the force-feed or pressure type in that the latter forces the oil to the main bearings first and then by suitable leads to the connection rod bearings, after which the oil is conveyed by ducts to the wrist pins. The wrist pins are fitted with a hole running lengthwise in them and the oil passes out from these to the cylinder walls. The overflow oil drains back to the pump and is again circulated by the pump.

Inquiries Received and Communications Answered

Dr. C. C. Haxel	Fowler, Ill.
A. D. Kellogg	Eureka, Cal.
T. W. Harris	Ephrata, Wash.
A. S. Barnett	Washington, D. C.
C. J. Harlin	Tonganoxie, Kan.
E. L. Hicks	Belvidere, Ill.
O. W. Heck	Antigo, Wis.
W. W. Niece	Redondo Beach, Cal.
Earle Boose	Decatur, Ill.
J. W. Cargle	Chicago
F. D. Kilgallan	Butte, Mont.
Chadron Garage Co.	Chadron, Neb.
F. E. Regnitto	Knoxville, Tenn.
Springview Garage	Springview, Neb.
George Smith	Sewalls Point, Va.
L. O. Kistler	Joy, Ill.
Guy L. Swiney	Greenview, Ill.
George J. Lunkley	Spanaway, Wash.
H. F. Hull	Defiance, Ohio
Roy D. Humes	Arkansas City, Kan.



By Kenworthy

Fig. 2—An exclusive MOTOR AGE *design for a four-passenger touring roadster*

DISKS OUT OF THIS PAIGE CLUTCH

Cork Inserts Must Be Put in by Special Tool

Belvidere, Ill.—Editor MOTOR AGE—I have a Paige No. 57439, model 6-46, and wish you would tell me how to connect an Old Sol two-wire spotlight on it. Can it be connected on the fuse box, or is it best on the battery?

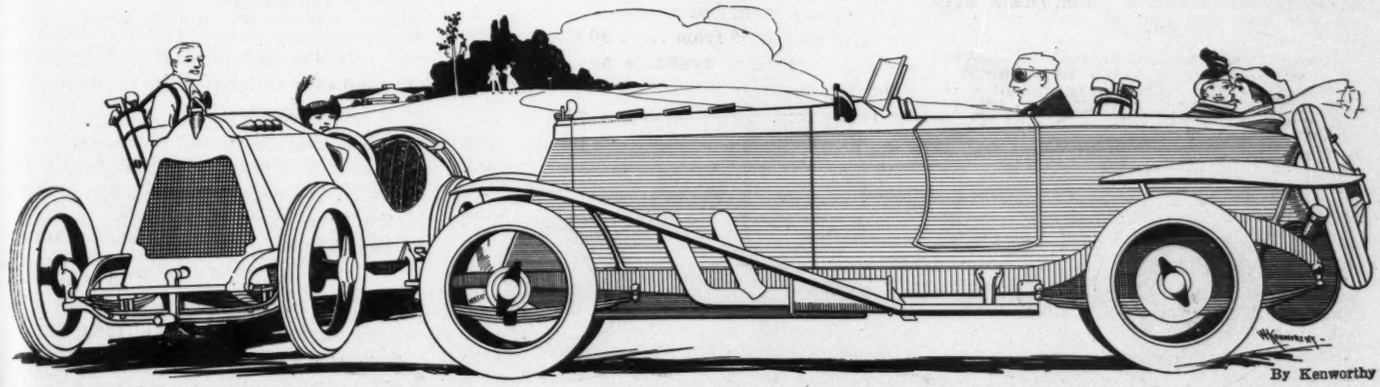
2—Tell me the best way to get the clutch out to recock it.—E. L. Hicks.

It would be best to wire this spot light direct to the fuse box, or as the factory calls it the lighting switch. One wire can be connected to the switch and the other grounded to any metal part of the frame or engine.

To remove the clutch plates it will first be necessary to remove the toe boards and front floor boards and disconnect the brake rods, both front brake and emergency, from the gearset. Next the propeller shaft can be dropped by disconnecting the two halves of the front universal.

There are four large cap screws holding the gearset, and when these are removed the gearset can be lifted away from the engine. This will expose the clutch housing and all that is necessary is to remove the cover and the disks can be taken out. Before removing the cover, however, it is well to have two studs made about 5 in. long. These are to be $\frac{5}{16}$ in. in diameter treaded for a distance of about $\frac{3}{4}$ in. with a 24-tread. The balance of the stud can be a U. S. S. tread and three U. S. S. nuts provided for each.

Remove two of the cap screws holding the clutch cover, just opposite each other, and insert the 24-tread ends of the studs



By Kenworthy

Fig. 3—Two exclusive MOTOR AGE *designs of sporting- type speedster and four-passenger roadster. The radiator has the slant of the Fageol type*

and tighten them by using two of the nuts as jam nuts. The extra nut should be run down the studs until it is tight against the clutch cover. The rest of the cap screws can be removed then, and as the nuts on the studs are backed away, the tension of the clutch spring will be released gradually, and the cover can be removed.

This operation is to be reversed to reassemble the clutch.

Recorking the disks necessitates the use of a special cork-inserting tool, and could not be accomplished by the average garage, and it is best to return the disks to the factory service department.

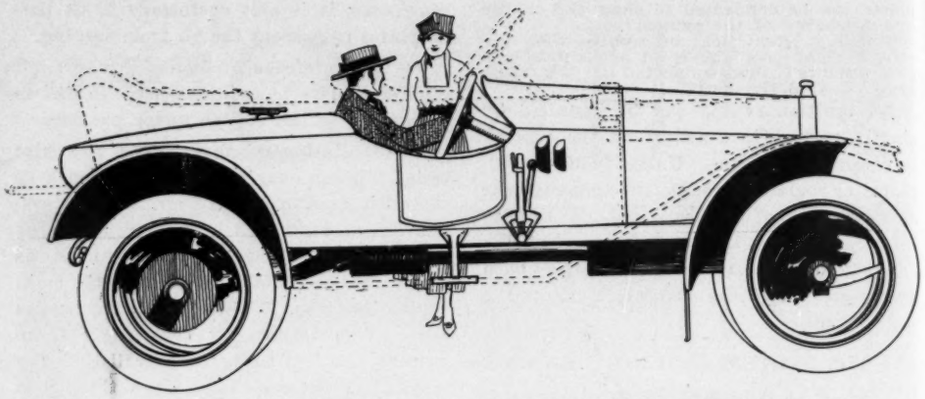


Fig. 4—Speedster body with boat lines on an Auburn 1912 model L-30

MAGNETS AND LIFTING CAPACITY

Reader Contemplates Making a Recharger for Generator

Antigo, Wis.—Editor MOTOR AGE—I am desirous of gaining a little knowledge relative to magnets and their lifting capacity. I have a 40 V. D. C. generator of 15 amp. capacity and am contemplating making a magnet recharger that will recharge magnets sufficiently to give them a lifting power of approximately 15 lb.

2—What size of wire would be best suited for this machine? How many feet per coil? Which is better and most advisable—the hollow or the solid core type?

3—What is the formula for determining the lifting power in pounds of magnets? What would be the lifting power of a magnetizer made up of 50 ft. of No. 30 wire? From the formula amperes $= \frac{\text{volt}}{\text{ohms}}$, and substituting the above figures, the amperage will be 7.7. Does this mean that the coils will take 7.7 amp. to overcome the resistance before they will start to recharge a magnet? Kindly explain this formula.—O. W. Heck.

You evidently are somewhat confused on the meaning of the terms current, pressure and resistance, as used in connection with the electrical circuit. The term current simply means how much electricity is flowing past a given point in a circuit in one second, just as the current in a pipe means the quantity of water flowing through the pipe in a certain time such as one second. A current of one ampere means there is one coulomb of electricity (the coulomb is the unit of quantity of electricity) passing every point in a circuit each second. The movement of electricity in a wire or electrical circuit meets with a certain opposition just as the movement of water in a pipe. This opposition or hindrance to the free movement of the electricity is called the resistance of the circuit and it is measured in ohms. An electrical pressure is required to overcome the resistance of the circuit and cause the electricity to flow or produce the current and this pressure is measured in volts. The current a certain pressure will produce is equal to the value of the pressure in volts divided by the resistance of the circuit in which the current is to be produced in ohms, or

$$\text{amperes} = \frac{\text{volts}}{\text{ohms}}$$

Now the magnetizing effect produced by an electric current depends upon the form of the circuit in which the current exists. Thus, the magnetizing effect of a current of a certain number of amperes in a straight piece of wire is not very great. If this piece of wire be bent into a coil and the current maintained constant in value the magnetizing effect will be greatly increased. The magnetizing action of a current in a coil similar to those used in the construction of remagnetizers may be determined by the following equation:

$$\text{Magnetizing action} = 1.256 \times N \times I$$

In the above equation N stands for the number of turns in the winding and I is the current in the winding in amperes. The magnetizing action, as given by the above equation, is said to be so many Gilberts. This magnetizing action of the current will produce a magnetic field. Every magnetic field is imagined as being composed of imaginary lines called lines of force. Now the total number of these lines of force, called the magnetic flux and measured in Maxwells, a given magnetizing action will produce depends upon the kind of material in which these lines are to be produced and also the dimensions of the material. The path taken by these lines of force is called the magnetic circuit just as the path in which the electricity flows is called the electrical circuit. In brief, the magnetic flux produced by a certain magnetizing action is equal to the magnetizing action in Gilberts divided by the opposition offered by the magnetic circuit to the establishment of these lines which is measured in Oersteds.

$$\text{Maxwells} = \frac{\text{Gilberts}}{\text{Oersteds}}$$

The reluctance of any part of a magnetic circuit is equal to the length of the part of the magnetic circuit in inches divided by 2.54 times the area in square inches times the permeability of the material. The permeability of any material is equal to its ability to conduct magnetic flux, as compared to air, and it is represented by the symbol u. The reluctance R is given by the following equation:

$$R = \frac{\text{length in inches}}{2.54 \times u \times \text{area in sq. inches}}$$

If the magnetic circuit is composed of several different kinds of materials or several parts of different dimensions, the total reluctance will be equal to the sum of the reluctances of the several parts, just as the total resistance of a circuit is equal to the sum of the resistances of the different parts of the circuit.

The design of a remagnetizer which may be easily changed to meet your individual requirements will be given in MOTOR AGE in the near future.

The lifting power of a magnet having both ends in contact with the piece of iron to which the weight is attached, as shown in the figure, may be computed by means of the following equation:

$$\text{Pull in pounds} = \frac{B^2 A \times 2}{11{,}130{,}000}$$

B is the number of lines of force per square centimeter at the surfaces in contact.

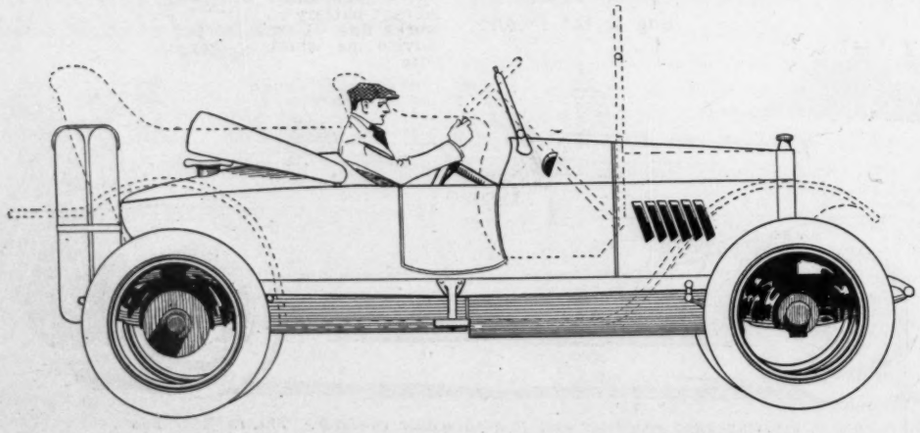


Fig. 5—Boat-type speedster body on model 10 Buick chassis

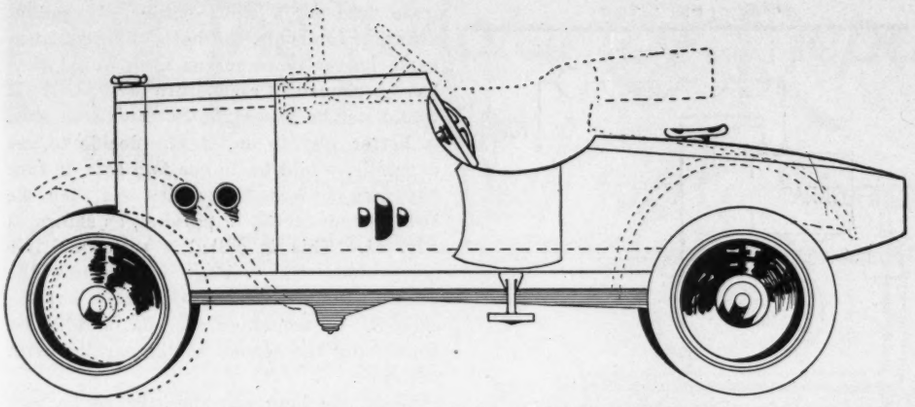


Fig. 6—Special Ford body with unusually large radiator in accord with reader's specifications

A is the combined area of the two contacts in square centimeters.

THE SUPERIOR OF TWO SIZED CARS

With All Conditions Considered Ideal Figures Given

Redondo Beach, Cal.—Editor MOTOR AGE—Which car would be the best hill climber, an eight-cylinder, 320 in. piston displacement, weight 4500, gear 4½ to 1, or a four-cylinder, 390 in. piston displacement, weight 3500, geared 3¼ to 1?—W. W. Niece.

The 390 cu. in. would be superior, considering all other conditions to be ideal in both cases. This is true because with everything else ideal the available torque for hill climbing will vary, as the displacement divided by the weight, with the whole fraction multiplied by the gear ratio. In other words, on the eight-cylinder car the expression for hill climbing ability is $\frac{320 \times 4.5}{4500} = 3.2$, and in the four-cylinder car the expression is $\frac{390 \times 3.25}{3500} = 3.67$, which is greater than 3.2. This, of course, assumes the same size wheels for both cars.

Auburn Made Speedster

Decatur, Ill.—Editor MOTOR AGE—Illustrate a way to convert a 1912 model L 30 Auburn touring car into a speedster, including the fenders.

2—Will a 35 hp. Rutenber engine, 5 in. bore, 4⅛ in. stroke, fit the 1912 model L 30 chassis fitted at present with 4 in. bore, 4 in. stroke Rutenber engine?—Earl Boose.

1—Shown in Fig. 4.

2—No.

Speedster Body on Chandler

Butte, Mont.—Editor MOTOR AGE—Where can I obtain a list of American made cars giving price and address?

2—Show diagram how a model 17 Chandler would look if rebuilt into a speedster.—F. D. Kilgallan.

1—From any issue of Motor World, 239 West Thirty-ninth Street, New York.

2—Shown in Fig. 7.

Special Ford Body

Chicago—Editor MOTOR AGE—would a radiator 5 in. thick, 14 in. wide and 30 in. high be top heavy for a Ford chassis? I have lowered my frame 4 in. and front axle extended 3 in. to front of frame.

2—Draw a sketch for Ford racing body showing same on chassis with following dimensions: Radiator, 30 in. high, 5 in. thick; hood, 25 in. long; cowl, 25 in. long; end of cowl to be 2 in. higher than radiator. Rear of seat 50 in. from dash; back of seat 20 in. high, and a round sloping tail coming to a pointed edge 8 in. high extending 12 in. further than rear wheels. Also estimate what price will be for building same; fenders not to be shown.—J. W. Cargie.

1—Not too heavy. It might, however, be too large, cooling the engine below an efficient temperature point.

2—The illustration is shown in Fig. 6. The work could be done for $200 or less.

Buick Into Speedster

Detroit, Mich.—Editor MOTOR AGE—Furnish suggestions for converting a model 17-10 Buick into a speedster type with top and windshield.

2—What company could furnish me with same and price?

3—Would a center control be advisable?—J. H. Lee.

1—An illustration of a suggested type is shown in Fig. 5.

2—There are several concerns in Detroit making a specialty of rebuilding cars.

3—No. It would not be worth the expense.

Test for Broken Plug

Chadron, Neb.—Editor MOTOR AGE—Is there any way to test a spark plug for a broken porcelain when the porcelain is not removable?—Chadron Garage Co.

No direct way. If other tests show that everything else is O. K. it may be taken for granted that the porcelain is at fault.

R. P. M. of Old Marmon

Knoxville, Tenn.—Editor MOTOR AGE—What is the r.p.m. of a 1911 Marmon motor at maximum speed and what horsepower?

2—Would aluminum pistons give this motor more speed?

3—What speed ought a 1911 Marmon car make with a cut down body?

4—What ratio gear has it?—F. E. Regnitto.

1—The maximum speed of the 1911 model 32 engine is 2200 r.p.m. at which it develops 55 hp., according to the factory.

2—Yes.

3—There is no means of approximating, so dependent is it on the condition of the car. As this is an old model, its long use may have so deteriorated it that it would not be capable of traveling within 10 or 15 m.p.h. of what it would when new.

4—The standard gear ratio was 3.1 to 1.

Ford Engine on Air Pump

Springview, Neb.—Editor MOTOR AGE—I have made an air pump from an old Ford engine, using only two cylinders. I cannot get enough high pressure. How can I arrange it satisfactorily, and at what speed should I run it?—Springview Garage.

To get high pressure you would have to fit new pistons with considerably less clearance than the stock pistons, probably .015 to .020 oversize. To these pistons it would be advisable to fit non-leaking rings.

Pistons May Fit Poorly

Sewalls Point, Va.—Editor MOTOR AGE—The engine on my 1911 model 65 Rambler pounds very much. When it is picking up I retard the spark, but it does not help any, and after it gains in speed to 15 or more m.p.h. it seems to have a rattling knock. The main and crank bearings seem to be O. K. What is the trouble?—George Smith.

It would be well to look to the fit of the pistons in the cylinders. An engine which has had as much use as yours undoubtedly has, is bound to wear, and it is very probable that the pistons have been worn oval, the cylinders have been worn large, or both things have occurred.

Ford Has Peculiar Jerk

Joy, Ill.—Editor MOTOR AGE—My Ford has developed a jerk which is not noticeable when running in low, but jerks when picking up on high. The engine is working fine and the hind wheels are tight. What is the trouble?—L. O. Kistler.

Although your description of the trouble is lacking in detail, it would be our assumption that the difficulty is in the carburetion system. With the present low grade of gasoline your engine will not accelerate quickly when the throttle is opened, taking a few moments for the gas to "catch up" before the engine again settles down to even firing. This is becoming a very common complaint. The remedy is to find a means to heating the gas better, possibly with a hot air attachment, or of taking more time in the process of acceleration.

Ammeter on Genemotor

Greenview, Ill.—Editor MOTOR AGE—Have put a genemotor starter and U. S. L. 12-80 storage battery on my 1917 Ford. The starter works fine. I want to put on an ammeter. Advise me where to get one; also how to wire it.

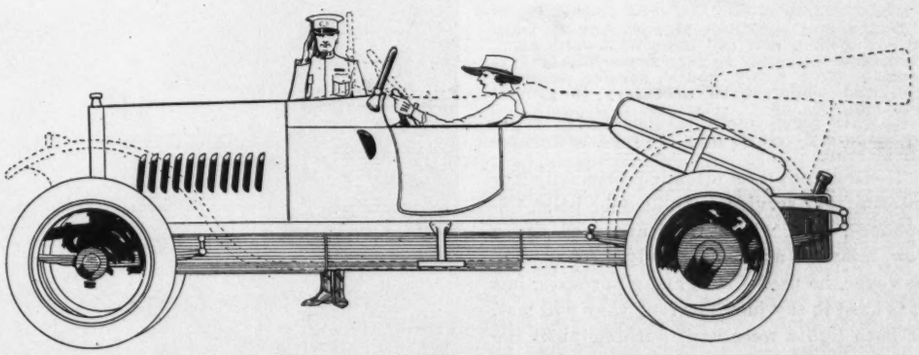


Fig. 7—Ultra-modern speedster body on a 1917 Chandler six chassis. There is a hollowed-out deck in the rear for extra tires

2—How will I wire a spotlight?—Guy L. Swiney.

1—You can buy an ammeter from any motor car supply house. The wiring is shown in Fig. 10.

2—You should wire the spot light direct to the wire from the battery.

ELECTRICAL SYSTEM IS DANGEROUS

Reader Not Advised to Install Planned Arrangement

Spanaway, Wash.—Editor MOTOR AGE—I have a Try-New-Life vibrator 22 volts D. C. which runs on 15 dry cells connected in series for two speeds, using twelve cells and fifteen. The vibrator has a push button switch on the handle to start and stop vibration. As dry cells are too expensive, I would like to know if I can run it on the current we use which is 500 V. D. C., which is taken from the trolley wire. The lights are connected in series of five each and the light is not steady because the cars pull on it. Show by diagram if I can run it on this current. We use 60 W. 110 V. and 25 W. 110 V. globes and have both in stock. Our wiring is exposed. Would connect a wire above switch on power wire and run to a board where I would put the globes to reduce the current to work vibrator only if possible. Which globes are the better, the 60 W. or 25 W. and is it best to use a small number of globes?—Geo. J. Lunkley.

We doubt if you will be able to work your vibrator on the high voltage circuit as you suggest doing, as there will be quite a change in voltage actually acting on the vibrator as the load on the vibrator changes and hence there will be a great variation in the speed for different loads. You failed to state the value of the current taken by the vibrator, but for example, let us assume it is .5 ampere. Now a 60-watt lamp will take approximately this current from a 110-volt circuit, so that five of these lamps in series with the vibrator may meet the requirements. You can readily see that the current is not governed by the requirements of the vibrator to any great extent, but almost entirely by the lamps.

You should connect your vibrator between the lamps and the ground connection, so as to reduce the likelihood of a short being formed by the vibrator being accidentally grounded. This connection will also reduce the strain to which the insulation of the winding is subjected. We are somewhat reluctant in advising you to try this at all as a number of rather serious accidents have happened in the use of similar vibrators when used on 110-volt circuits.

ABOUT DRY CELLS FOR LIGHTING

Arrangement Will Give About 15 Hrs. Service

Defiance, O.—Editor MOTOR AGE—I want to run a dash and tail lamp of 3-volts each, connected in series to four dry cells, or batteries. How many hours' service would I get, and would it be necessary to ground one side?

2—How much more service would I get by using a 6-volt 40 amp. storage battery?—H. F. Hull.

1—Dry cells are intended primarily for intermittent service, such as door bells, telephones, etc., where they are used for a few minutes at a time only. They can, however, be used for lighting purposes, but it is hard to say just how long they will last. If both lights were kept burning until the cells were exhausted, the latter would give about 15 hrs. of service. If the lights were used for a short while only and at different intervals, the batteries would last much longer inasmuch as they would then have a chance to recuperate somewhat. It would not be necessary to ground on side. A better way to do, if you decide to use dry cells, would be to use two sets of four batteries connected in series and then the two sets connected in parallel, as shown in Fig. 11. This is called a series-multiple connection. The voltage will remain the same as if only one set were used, but the capacity or amperage will be doubled by connecting the second set in parallel with the first.

2—In the long run the storage battery would give the better result. If both dash and tail light were of 2 candle power and drew together 1 amp. of current per hour from the battery the latter would give about 40 hrs. of light before recharging.

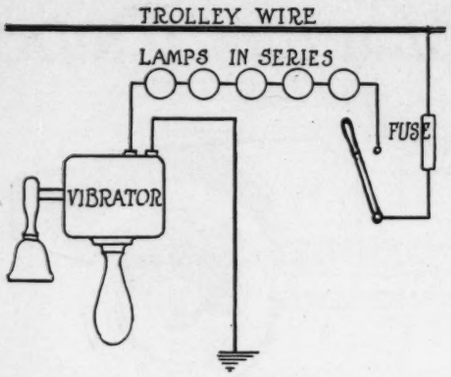


Fig. 8—Possible wiring of vibrator from trolley wire. Such use of current is liable to be very dangerous

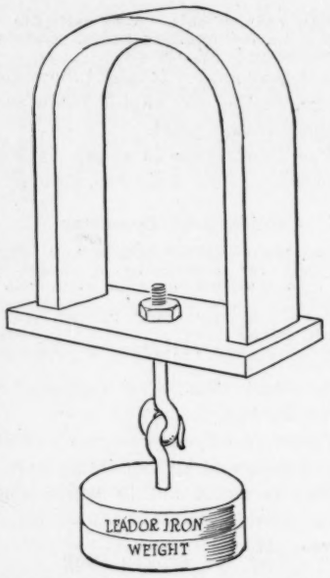


Fig. 9—Simple method of testing lifting power of magnet

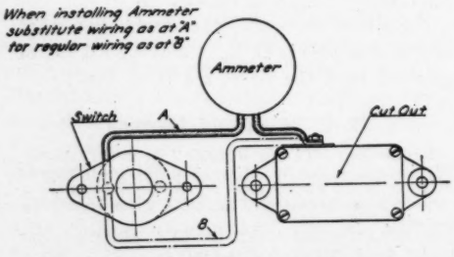


Fig. 10—Method of wiring an ammeter to genemotor Ford system

Rebuilt Oakland 32

Arkansas City, Kan.—Editor MOTOR AGE—What is the wheelbase and gear ratio best suited for half-mile track work with an Oakland model 32.

In Fig. 12 is a photograph showing how we have rebuilt this model.—Roy D. Humes.

The present wheelbase is satisfactory. We would advise a 3 to 1 gear ratio.

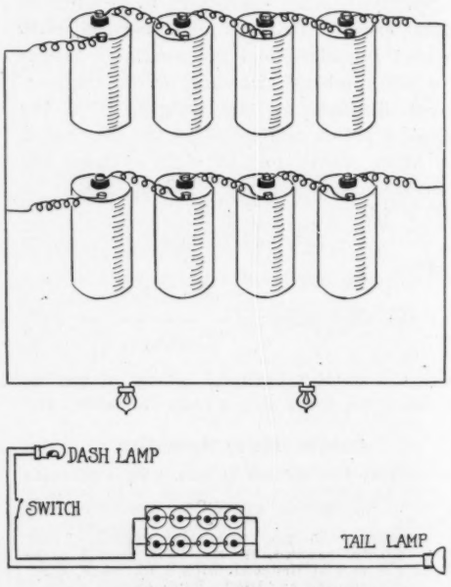


Fig. 11—Method of wiring light dry cells for lighting tail and dash lamp

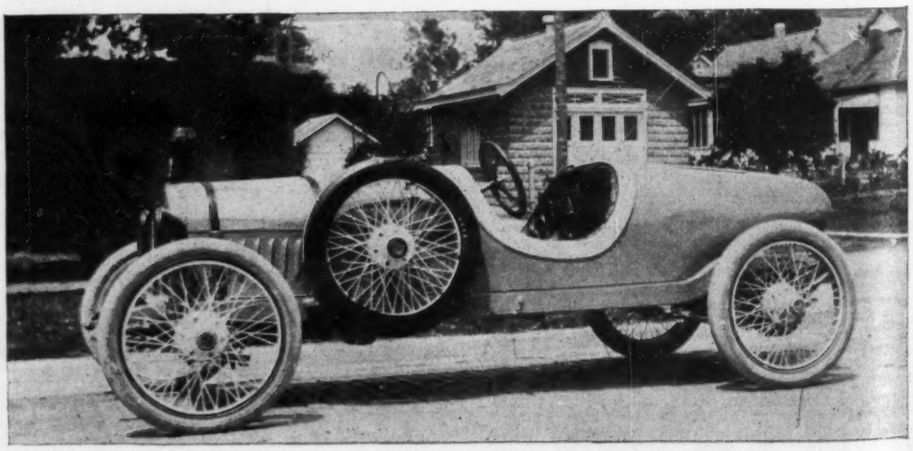


Fig. 12—A model 32 Oakland rebuilt into a speedster by a MOTOR AGE reader

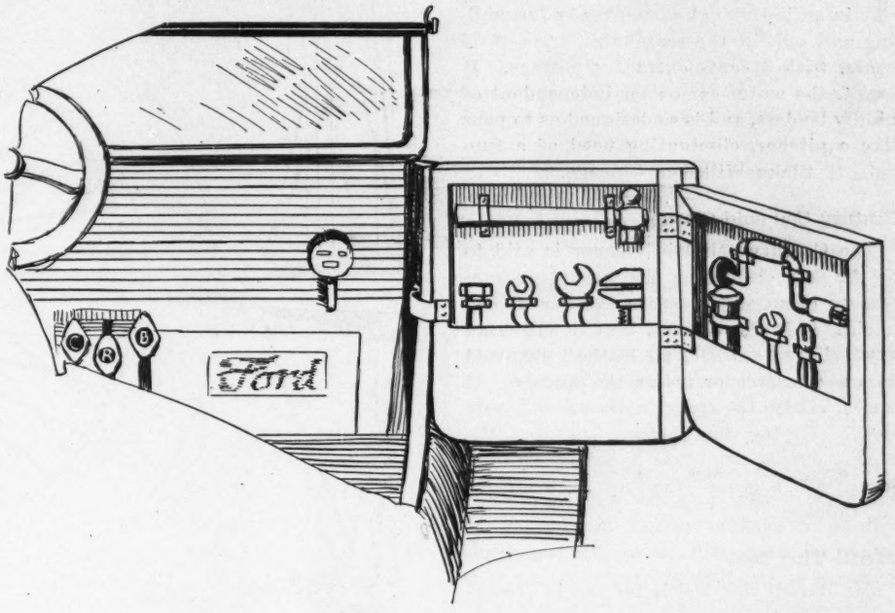
The Motor Car Repair Shop

Double Door for Tool Compartment

MARTINSVILLE, Va. — Editor MOTOR AGE—In the interests of other motorists, I would like to explain a very useful device I made for my Ford car whereby I have my tools handily reached while occupying a space other motorists may not think of. The usual tool box on the running board has to carry so much stuff, that the tool you need necessitates emptying the box to find it.

The front door is arranged with a light door of strips of wood properly braced, the hinges screwed to a strip of wood placed up and down behind the metal door lock; the inner door spring catch fits nicely in the notch left by removing the center cross brace next the leather stop. Then a pocket made of canvas or leather in the lower portion of each door with a strap or two to keep the tools in place. Replace the door lining and put new strips of gimp, tacking with black headed tacks as it was before.

It will contain all the tools nicely and would never be noticed unless particular attention was called to it. If desired a lock could easily be used instead of spring catch. The regular tool box can then accommodate spare tubes as well as pump and jack.—George C. Griffith.



A sub-door attached to the front door of a Ford, providing a convenient tool-carrying compartment

Proper Tire Care

The matter of proper tire care is perhaps about the most important consideration of the average motorist, for it is more vital to his pocketbook than anything else in connection with his car. Much is written and more is said about how to get the maximum mileage out of tires, but the views of authorities vary so widely, and the published advice varies so widely that the car owner is often at sea as to just what is the best for his tires. Such statements should be discredited immediately. Tire makers have made an exhaustive study of this pressure matter and their word should be taken as correct. The first and most important tire rule is to pay strict attention to the specified pressures.

Under-inflation is the thing to look out for, not overinflation. If it is found necessary for comfort and protection to carry a lower pressure than is recommended, it may be done, but one must always consider that the life of the tire is being shortened and he cannot blame a damaged casing to temperature, or defects in the casing. If, for any reason, it is imperative that the pressure be less, then the only economical way one can do it is to install oversize tires, tires capable of carrying a great deal more weight than they are taxed for.

One authority states that it is practically impossible to injure tires by overinflation. This is, of course, speaking of new tires. It does not hold true with old tires weakened by blowouts or long wear. Tires are built with a very high factor of safety, and in tests they have been inflated to as high as 300 lb. per square inch pressure without any harm to the tire.

Of course, there are limits to which the inflation can be carried for comfortable driving, and obviously a tire inflated to too high a pressure defeats the purpose for which it is used. The tire makers have specified pressures which are the best compromise between lack of resilience on one hand and freedom from under-inflation on the other.

It will be interesting to many to know that there is no truth to the statement that tires should be run at a lower pressure in summer than in cold weather to take care of the greater expansion of air in them and thus prevent undue strains which might cause blowouts. A careful test to see just what the result of hot-weather running is, was conducted and it proved conclusively that there is at the most not over a few pounds pressure increase through driving over hot pavements or roads, and this is really no difference at all so far as the welfare of the tire is concerned.

Berling Magneto Line

(Concluded from page 37)

by taking out two screws holding the upper portion of the driving end.

The Berling ED type is similar to the E except that it is a dual design and has in addition a battery interrupter and terminals provided for connection to a combine coil and switch of the dash type. The dual type is particularly adapted for trucks where two sources of ignition supply are desired, and for marine engines where it is difficult to turn the engine over rapidly enough by hand to start on the magneto.

Dry Cells Renewed

A method of rejuvenating the ordinary dry cell has been discovered by the class in physics directed by Prof. Arthur Smith of the high school at Appleton, Wis. At a cost of 7 or 8 cents an exhausted dry cell is restored to from 50 to 60 per cent of its original activity at full voltage. The tests have been exhaustive and proved in many cases. Dry cells, with zinc unpunctured and retaining about .01 amp. activity, are used. The sides of the zinc cylinder are perforated 3 in. from the base and the cell soaked in distilled water, perforations alone immersed, for 30 hrs. Then they are heated about 10 hrs. and placed in a strong vinegar solution for 48 hrs., sal ammoniac and hydrochloric acid being added to maintain acidity. The cells then are dried at a high temperature and placed in a shallow bath of sal ammoniac and potassium cynate, and a catalytic agent added. Three hours later the cells show .05 to .06 voltage and 90 per cent of full ampere-hour capacity.

The Accessory Corner

Collapsible Water Bucket

THIS collapsible water bucket is packed in an individual carton ready for mailing and sells at the reasonable price of 35 cents, with 3 cents extra for postage. It makes the motor car owner independent of kindly lenders, and is so designed as to pour like a pitcher, eliminating need of a funnel. S. Blake Willsden, Chicago.

Century Celluloid Cleaner

The Century celluloid cleaner is said to be the only cleaner on the market guaranteed to clean and preserve the life of celluloid. It is also claimed that it will clean any polished surface, all leather, etc., and does not scratch or injure the surface. It comes ready to apply with an old soft cloth. Wiping the surface dry does the work. Prices, 50 cents a bottle, $5.50 a dozen; $60 a gross.—Century Auto Supply Co., Chicago.

Burrill Tire Tool

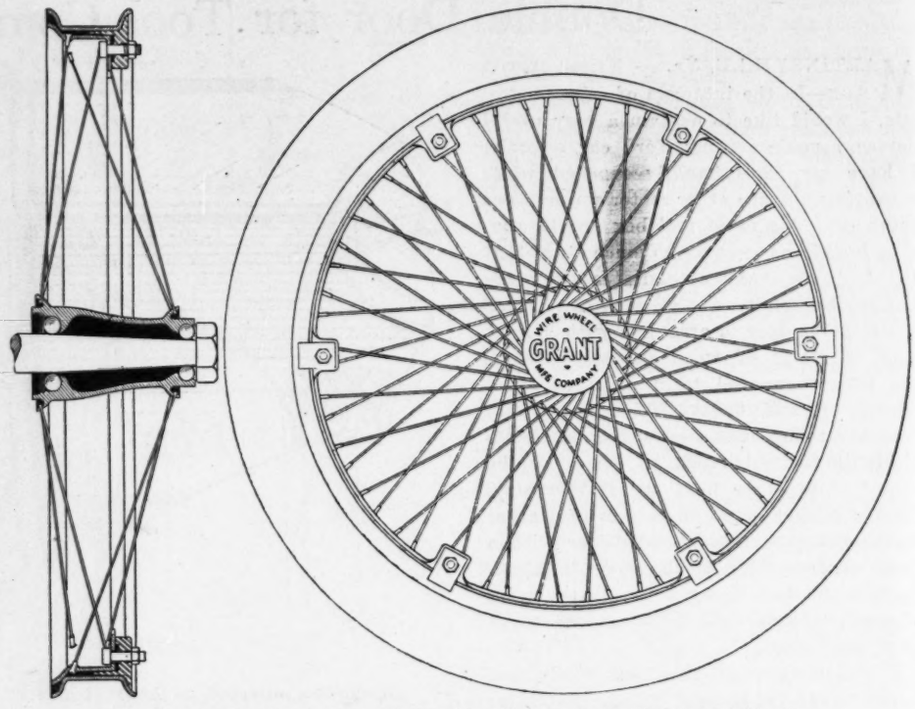
The Burrill tire tool is for use in removing and inserting tubes. It expands the rim so that the shoe can be removed easily, the tube taken out and replaced or repaired and the tube remounted with the tire in a vertical position. If the rim is rusted or marred it may be necessary to strike a quick blow with a light hammer or wrench near the valve stem reinforcement after applying the strain of the tool. —Price, $3, General Appliance Co., Inc., Boston, Mass.

Gant Meter for Dealers

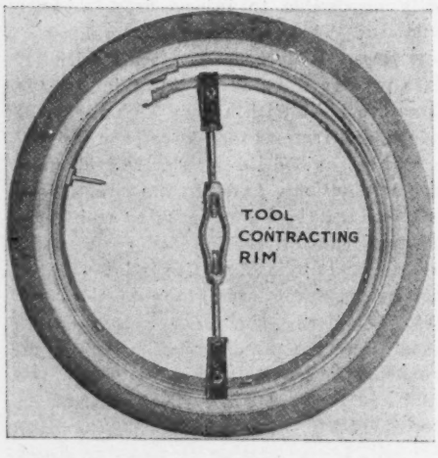
The Gant meter is designed for the hardware general merchandise, electrical supply and motor car accessory jobbers and dealers. It prevents overmeasures and undermeasures, the indicator on the dial dial registering accurately to the fraction of a foot up to 100 ft., at which time the machine automatically clears itself. Originally intended for measuring rope, wire cable, etc., it has been found efficient in handling copper and brass tubing, ignition cable or any kind of insulated wire, etc. Price, $5 in the United States and $8 in Canada.—John E. Chumbley & Co., Nashville, Tenn., distributors.

Grant Wire Wheels

A wire wheel designed to replace the stock wood wheel without the necessity of a special hub or bushing is being put on the market by the Grant Wire Wheel Mfg. Co., Chicago. The new wheel is not demountable, but a demountable rim is utilized for tire changes so that only four wheels need be purchased, the spare parts being carried on a demountable rim as with the stock wood wheels.



The Grant wire wheel, a new application of wire wheel and demountable rim combination



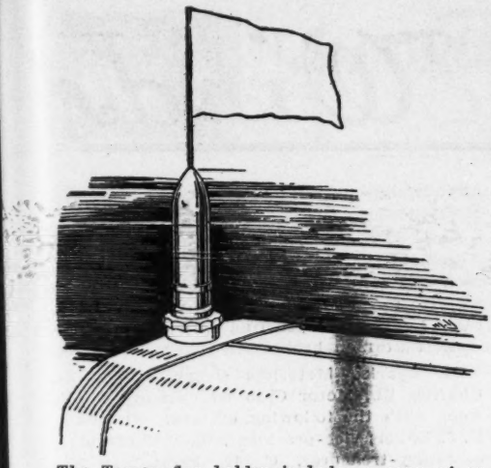
Burrill tire tool, showing method of contracting rim

The Gant meter, which measures copper and brass tubing as well as rope, etc.

The fact that no special arrangements are required for making the wheel adapted to the stock axle means that these can be supplied at lower cost than would otherwise be the case. It is arranged to carry any of the demountable rims now manufactured. The wire wheel gives the added nicety of appearance and easier riding qualities, at the same time eliminating the necessity of carrying a spare wheel and of having a special fitting for application to stock axle. It is stated that the wire wheel can be produced and sold at the price of the original wooden wheel. The spokes are laced so that they have equal tension at all times and side thrusts will not disable them. The wheel is the design of A. C. Grant, formerly in the employ of the United States government. The company is taking possession of a factory which gives them 84,000 ft. of floor space, and in which it is expected to turn out 150 sets per month. The first production will be on the Ford equipment, which will be sold at $30 per set of four.

Safety Signal Light

The Safety signal light comprises the warning signal, an entirely independent rear signal and license bracket, all fastened to the rear lamp bracket in the usual manner. It is solidly and durably constructed of drawn steel, and heavily finished in black japan. The operating mechanism is a push button switch attached to either the steering wheel, clutch or brake pedal, as the user may prefer. A pilot light located on the dash or instrument board serves as an indicator of the operation of the signal light. Installation is simple and can be made with the ordinary tools of the



The Tamco flag holder includes a copy of an American shell

car. Price, complete with pilot light, $7.50; without pilot light, $7.—Motor Signal Co., Chicago.

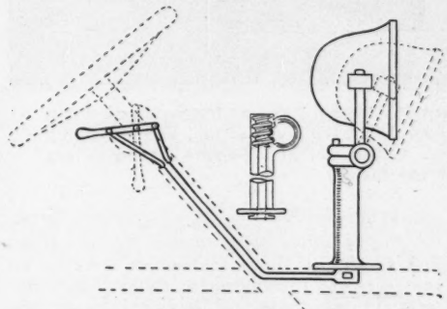
Folding Seats for Trucks

A U. S. army officer has designed a patented folding seat for use on army motor trucks in transporting infantry, which has been tested in the Southern Department, and has met with the approval of the commanding general, the chief quartermaster and other officials who have seen it in use. Folded and not in use, it lies flat in the bottom of the truck bed. In use it permits forty or more men to be carried on a 3-ton truck with their full field equipment. Eight are used on each truck. E. O. Saunders, captain Ninth infantry, Fort Sam Houston, Tex., is the designer.

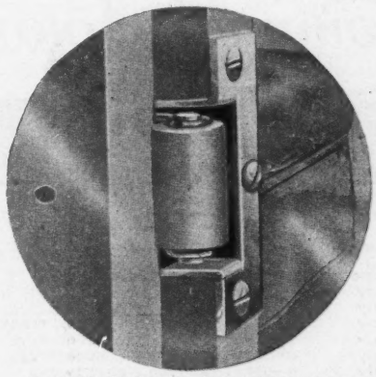
Dimming Brackets for Headlights

A bright, white light on the road ahead with an absence of glare is possible with the use of Widney headlight brackets. The device was demonstrated to a representative of MOTOR AGE, and it was proved to him that glare was eliminated entirely by tilting the headlight down, yet the full power of the light was thrown on the road in front of the car. It is probably the simplest device yet offered for this purpose. There are no visible moving parts—in fact, the assembly is so compact that it is hardly noticeable. It operates from a pair of piano wires connected to a lever on the steering column. These wires attach to chain which operate a small sprocket on the bottom of the shaft which is contained

Safety signal light complete as sold except for pilot light

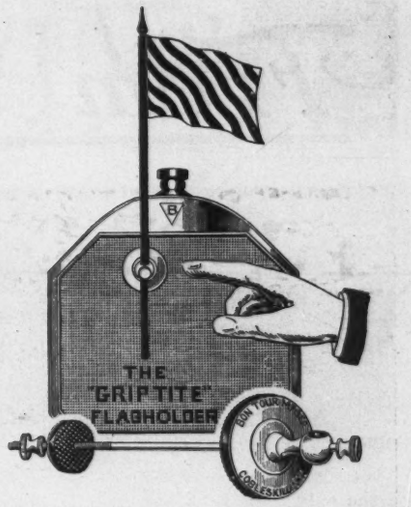


The Widney headlight, designed to eliminate glare



Puckett device to keep doors from rattling

within the lamp bracket. Turning of this shaft operates a worm which in turn operates a gear connected directly to one headlight bracket and by a cross shaft to the other bracket. Thus the worm tilts the headlight forward and the worm and gear, being irreversible, lock it in place. The



The Griptite flag holder comes in polished brass, nickeled or black

operation requires very little effort. Charles W. Widney, Melrose Park, Ill., is the inventor and holder of patents.

Griptite Flag Holder

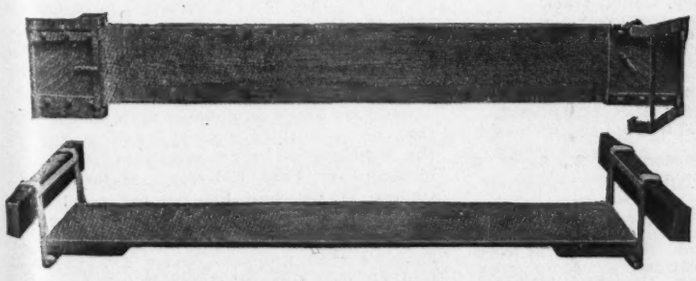
The Griptite flag holder is a simple device for holding any size flag on the front of the radiator in any position or at any angle, and can be used in pairs or singly. It is attached quickly and can be removed by a slim wire rod adjusted with a thumb nut. Corrugated heat-proof rubber cushions prevent contact of the radiator with the front plate and metal washer at the end of the rod. No tools or clamps are required for rigid attachment. The flag holder is made in polished brass, nickeled or black. Price, 50 cents.—Bon Tour Mfg. Co., Cobleskill, N. Y.

Radiator Cap Flag Holder

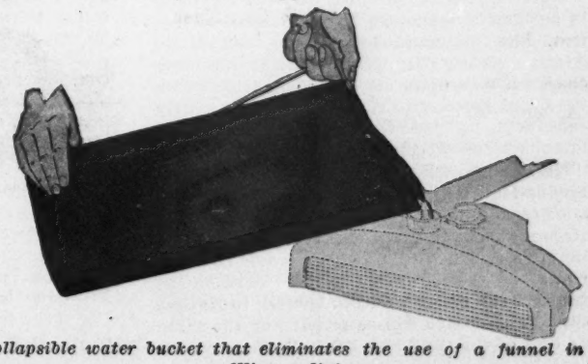
This flag holder fits any radiator cap, and is a copy of an American five-pounder. It is made of highly polished metal that will not rust, and fastens securely on the radiator, adding the 5-lb. shell emblem to the flag. Tamco Mfg. Co., Dayton, Ohio.

Keeps Doors from Rattling

The Puckett Anti-Rattler is adjustable to permanently keep the doors from rattling, and is said to be the only device on the market which permits of continuous adjustment. It is attached easily and has nothing on which the clothing can catch. Price, 50 cents.—Western Auto Specialty Co., Iowa City, Iowa.



Folding seat for trucks in army use, which was designed by an army officer



Collapsible water bucket that eliminates the use of a funnel in filling radiator

From the Four Winds

WHEN MOTOR CARS PUMP WATER—Down at Abilene, Tex., an irrigation pumping plant is run by motor car power. An old model Chalmers gives 60 hp., and the pump has a capacity of 2200 gal. a minute. Dr. W. T. Stewart and Eugene Debogary are the owners of the farm

ASSOCIATION to Buy Liberty Bonds—The St. Louis Motor Trade Accessory Association is going to invest its surplus funds in Liberty Loan bonds.

Hill Banquets Chauffeur Who Enlists—Louis W. Hill, president of the Great Northern road, gave a farewell banquet for his chauffeur, A. Larson, who went to the aviation camp at St. Louis.

New Highway Body Organizes—The Chicago, Black Hills and Yellowstone Park Highway Association has been incorporated by T. B. Roberts, Pierre; C. L. Millet, Fort Pierre, and O. M. Phelps, Huron, S. D.

May Use New Tags Dec. 31—An amendment to the New Jersey Motor Vehicle laws allows the use of tags for the new year on the last day of the old year, in order that motorists may have one day of grace in which to make the change.

Jitneurs Try to Recall Commission—Because of the recently enacted jitney ordinance, which legislated 400 jitneys off the resort's principal thoroughfare, the Atlantic City, N. J., jitney men's association has started a movement to recall the city commissioners.

Yellowstone Expects Heavy Traffic—Indications are for 20,000 motor cars over the Yellowstone trail this summer, according to Secretary H. O. Cooley, of Aberdeen, S. D., who has opened an information office in Minneapolis, Minn. Offices will be maintained at Miles City, Spokane and Seattle.

Motor Buses to Atlantic City—A company is seeking a franchise for a motor bus line from the mainland to Absecon island, on which Atlantic City, N. J., stands. Trolleys charge a fare of 10 cents for the trip, which the buses promise to run for a nickel. Thirty cars will be put into service across the famous Meadow boulevard.

New Highway Is Launched—The Union Pacific Highway Association is a new western good roads body formed by Colorado and Kansas motoring enthusiasts to establish, improve and mark an official motor route to run along the main line of the Union Pacific railroad the 665 miles from Denver to Kansas City. The course will be practically the same as that of the Gold Belt road all the way, except between Limon and Oakley, where the new route will cut 10 miles from the 675 of the old one by swinging southeast through Hugo and Cheyenne Wells instead of keeping on east through Burlington to Colby, Kan., before turning south. The new organization already has raised $3,000 for marking and preliminary development work.

Rahe School Admits Women—Rahe's Automobile Training School at Kansas City, Mo., has established a women's department, where women are to be given practically the same training in operating cars and in repair work that men have been given heretofore.

St. Charles Motorists Organize—The St. Charles, Ill., Motor Club was organized this week with the following officers: President, E. J. Baker; vice-president, W. P. Lillibridge; secretary-treasurer, C. H. Hunt. It was voted that the century course between St. Charles and Chicago via Aurora and Elgin should be marked. The highway is 104 miles long.

Committee to Hear Traffic Grievances—To help get greater co-operation between motor dealers and police officials in the interest of traffic safety in Denver, Col., a special grievance committee has been appointed by the Automobile Trades Association of Colorado to handle cases of minor traffic violations reported by police against members of the trades body.

Urges Care in Flag Displays—Because of several serious runaways of horse teams which have been frightened by flapping flags attached to automobiles, Motor Vehicle Commissioner Dill of New Jersey has requested motor car owners to display the colors in a way that will not allow them to flap and snap in the breeze. Pasting small flags on headlights is also objected to by the commissioner.

To Mire Is Farmers' Fault!—Penalty for having bad stretches of road near farms is exacted by an agreement passed at a meeting of Burleigh county, N. D., farmers. This is to the effect that $5 for dragging a motor car out of the mud is too much and shall be cut to $1. The resolution cited that a farmer who allowed a car to be mired in front of his farm should apologize to the owner and pull the car out free.

Nebraska Chooses Lincoln Short-Cut—At a meeting held at Oshkosh, Neb., a short-cut route from the Lincoln highway at or near Sutherland, Neb., to the Yellowstone trail at Wendover was formulated. It will be called the North Platte Valley Highway system and will include not only the most direct but also alternate routes. The colors chosen are yellow and blue. A committee was appointed to see to the marking of the road and its branches.

Must Post Capacity on Bridges—Commissioner of Motor Vehicles William L. Dill has notified all county authorities in New Jersey to post the carrying capacity of every bridge in a prominent manner on the structure as a warning to truck drivers. Drivers venturing on bridges that are not supposed to be able to take the load they are driving will hereafter do so at their own risk. Increase in market hauling and other freight business by motor truck is responsible for the new ruling.

Goethals Stays on Job—In spite of the fact that he is working sixteen hours a day on the development of a merchant marine to circumvent the U-boats, Major-General George W. Goethals has not severed his relations with the New Jersey highway department, of which he is virtually head. As Jersey's road program covers five years, it is likely that General Goethals will have finished his government work and be in direct charge of the road building before much of the $15,000,000 is spent.

Coming Motor Events

CONTESTS

—1917—

June	16	Chicago, speedway.
July	4	Visalia, Cal., road race.
July	4	Spokane, Wash., track.
July	4	Benton Harbor, Mich., track.
July	4	Uniontown, Pa., speedway.
July	4	Tacoma, Wash., speedway.
*July	4	Omaha, Neb., speedway.
July	14	Rochester, N. Y., hillclimb.
July	15	Missoula, Mont., track.
July	17-19	Intercity Reliability.
July	22	Anaconda, Mont., track.
July	29	Great Falls, Mont., track.
Aug.	5	Billings, Mont., track.
Aug.	17	Flemington, N. J., track.
*Sept.	3	Cincinnati, Ohio, speedway.
Sept.	3	Uniontown, Pa., speedway.
Sept.	6	Red Bank, N. J., track.
Sept.	8	Pike's Peak, Colo., hill climb.
*Sept.	15	Providence, R. I. speedway.
Sept.	22	Allentown, Pa., track.
Sept.	28	Trenton, N. J., track.
*Sept.	29	New York, speedway.
Oct.	6	Uniontown, Pa., speedway.
Oct.	6	Danbury, Conn., track.
*Oct.	13	Chicago, speedway.
Oct.	13	Richmond, Va., track.
Oct.	27	New York, speedway.

* A. A. A. Championship Award Event.

MEETINGS

June 25-26—Washington, D. C., S. A. E. midsummer.

SHOWS

June 20-27—Montreal used car show.
Aug. 6-18—Fremont, Neb., tractor demonstration.
Sept. 9-15—Spokane, Wash., Interstate fair.
Sept. 2-9—Milwaukee show, State Park fair, West Allis.
Oct 13-28—Dallas, Tex., state fair.

Among the Makers and Dealers

JACKSON Will Open Canadian Branch—The Jackson Motor Car Corp., Jackson, Mich., will establish a plant in Windsor, Ont.

Allee Becomes Hayes Comptroller—Herbert D. Allee has been elected assistant treasurer and comptroller of the Hayes Mfg. Co., Detroit.

Reo Production Increases—The Reo Motor Car Co. manufactured 15,055 passenger cars and 4566 trucks from Jan. 1, 1917, to April 18, 1917.

Sangbush Leaves Abbott-Detroit—F. E. Sangbush has resigned as sales manager of the Abbott-Detroit Motor Car Co. to become sales manager of the Columbia Motors Co.

Haynes Promotes How—S. M. How, formerly eastern sales representative of the Haynes Automobile Co., Kokomo, Ind., has been promoted to be general sales manager.

Gernandt Opens Chicago Office—W. G. Gernandt, formerly of W. G. Gernandt & Co., consulting enginers, Detroit, has opened an office in Chicago for motor car engineering consultation.

Anderson Leaves Packard—R. F. Anderson, of the body enginering department of the Packard Car Co., has resigned to become body engineer of the Grand Rapids Hayes-Ionia plant.

Farnsworth to Sell Cars Direct—M. G. Farnsworth, formerly northwestern sales representative for the Abbott Corp., has resigned to form the Farnsworth Motor Car Co., which will distribute the Saxon and Abbott cars and Denby trucks.

Chevrolet Salesmen Go to Plattsburg—M. R. McAdoo, Jr., and W. A. Coleman, both of the sales department of the Chevrolet Motor Co., and M. J. Correy, of the material department, have gone to Plattsburg as members of the Officers' Reserve Corps.

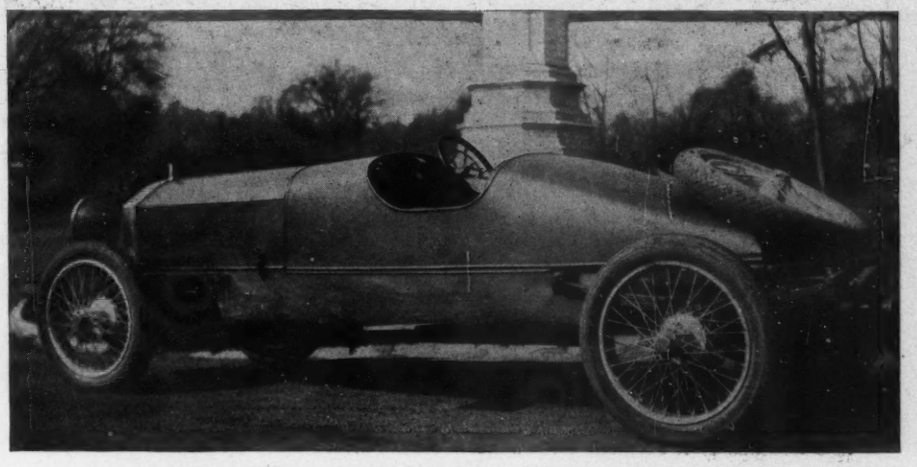
Fitch to Direct Overland Service—H. G. Fitch has been appointed director of service for the Willys-Overland Co. at Toledo, Ohio. K. R. Jacoby, formerly service manager of the Willys-Overland Co., has been appointed assistant sales manager.

Russel Employees Get Bonus—Employees of the Russel Motor Axle Co., Detroit, have been placed on a bonus system which will give each worker who qualifies an additional 10 per cent of his monthly wages. Payments will be made each three months beginning Aug. 1.

Clark Resigns to Join Reserve Corps—C. F. Clark, who for several years has been general manager of the Michigan Electric Welding Co. and a director of the Steel Products Co., of Cleveland, Ohio, has resigned to become a member of the officers' reserve corps.

Barley Makes Appointments—H. H. Harris has been appointed district manager of the central states for the Barley Motor Car Co., maker of the Roamer. Robert Lansing has been appointed special factory representative, covering the major portion of the south and southwest.

Jenkins Increases Working Capital—The Jenkins Vulcan Spring Co., maker of motor car springs, has issued its 1917 catalog for springs on practically all American makes of cars. This company carries in stock at its plant and four branches a total of 90,000 replacement springs, covering 588 separate and distinct types of cars. The business started in a small way five years ago, with an initial stock of about 100 springs. It is now working overtime. An increase in capital from $60,000 to $200,000 has been made to take care of the increase in business.



REMAKING A 1910 MODEL—Meister & Patterson, Balbo, Ill., makers of speedster bodies, made this car out of a 1910 six-cylinder Napier. They get 60 and 70 m.p.h. with it

Scripps-Booth Promotes Clark—F. B. Clark has been promoted to the position of general supervisor of districts for the Scripps-Booth Motor Car Corp., Detroit.

Callender Leaves Plant for Agency—C. E. Callender, who was secretary of the Olympian Motors Co., of Pontiac, is now the president of the Olympian Motor Sales Co., Chicago.

Holder Becomes Harroun Auditor—G. A. Holder has been appointed general auditor of the Harroun Motors Corp., Detroit. Mr. Holder was formerly special auditor for the Maxwell Motor Car Co.

Eldredge Gets Hood Offices—Frank M. Eldredge has been elected secretary and treasurer of the Wallace C. Hood Service Bureau. Mr. Eldredge will continue as director of advertising and publicity of the company.

Dail Steel Products Expands—The Dail Steel Products Co., Lansing, Mich., is erecting a new factory addition and office building. The company was recently recapitalized for $100,000. It will branch out into the accessories business.

Freeman Joins Fuller & Sons—Lowell C. Freeman has been appointed chief engineer of the Fuller & Sons Mfg. Co., Kalamazoo, Mich., transmission maker. Mr. Freeman was formerly chief engineer of the Denby Motor Truck Co.

Whitmore Heads All-Season Body Co.—C. W. Whitmore, of the body department of the Packard Motor Car Co., is resigning to become president of the All-Season Body Co., Marshall, Mich. The company has closed a $250,000 contract for 7500 bodies for the Briscoe Motor Corp. and also is making an experimental top job for the Chevrolet Motor Co.

Managers Give $5,000 for Ambulances—Matthew C. Moore and J. W. Garbutt, managers of the White Automobile Co., Milwaukee, Wis., have made individual donations of $2,500 to the new ambulance company of the Wisconsin National Guard division at Milwaukee for the purchase of two ambulances. The new company will be equipped with twelve ambulances and three motor trucks, all White cars, donated by citizens of Milwaukee.

Jordan to Direct Bell Sales—B. P. Y. Jordan has become managing director of the sales of the Bell Motor Car Co. H. F. Gundrum is in charge of the service department.

Clum in New Factory—The Clum Mfg. Co., maker of motor car and truck switches, has moved into a new factory at Milwaukee, Wis. This company also makes other electrical specialties. The new plant will give it four times its former space.

Sandwich Leaves Ames—J. T. Sandwich, formerly purchasing agent for the F. A. Ames Co. and its two subsidiaries, the Ames Motor Car Co. and the Carriage Woodstock Co., Owensboro, Ky., has resigned to enter the employ of the Service Motor Supply Co., Chicago.

Lejuste Leaves Haynes—Charles Lejuste, for more than four years with the Hughes Automobile Co., has resigned as production manager. Before coming to the Haynes Mr. Lejuste had served as purchasing agent with the Apperson Automobile Co. and also held this position while with the Haynes. He has not announced his future plans.

Two Join Haynes Staff—A. W. Milman, formerly with the Mitchell-Lewis company, has been appointed assistant purchasing agent of the Haynes Automobile Co. to succeed T. C. Heady, who is now with the Smith Form-A-Truck. H. R. Keeling has been appointed advertising manager to succeed R. T. Gray, now with the Shuman advertising agency.

Sampson Trailer Company Formed—The Sampson Trailer Co., has been organized with an authorized capital of $150,000. E. T. Towar, of the Towar-Aires Co., Detroit, will be the president. Maynard Smith and other outside capitalists are interested. Frank T. Hulswit, president of the United Motors Truck Co., is an important factor in the enterprise, and it is through him that it has been located in Grand Rapids, Mich.

Receiver for Gibney Is Appointed—A receiver has been appointed by the United States district court at Philadelphia for the Gibney Tire & Rubber Co., Conshohocken, Pa., against which proceedings in bankruptcy were brought recently. Bond was fixed at $50,000. The assets of the company

MARMON HAS RECORD DRIVEWAY—One of the biggest Marmon driveways ever held was that of twenty-one cars valued at $65,000 driven away by Charles E. Gambill, manager of the Chicago agency, and forty-seven customers and employees

are $372,697 against liabilities of $719,361. It is claimed by stockholders that the assets are sufficient to cover the liabilities.

Lavine Gear Co. Expands—The Lavine Gear Co., Racine, Wis., is adding to its plant. The changes will triple the production.

Murray to Cover Corcoran Territory—Martin Murray will cover the central states for the Corcoran Mfg. Co., maker of motor car fenders, hoods, radiators and tool boxes.

Green to Detroit Battery—S. J. Green, formerly western district general manager for the American Everready Co., has been appointed general sales manager for the Detroit Battery Co.

Amco Motor Co. Moves—The Amco Motor Co., Inc., has moved from the Loth Mills, Norwalk, Conn., to the John Davenport foundry, Stamford, Conn. The two concerns recently were merged under the title of Springfield Motors Co.

Moore Opens Chicago Office—Novelty marked the opening of the Chicago office of the Moore Motor Vehicle Co., Minneapolis, Minn., last week, when the car which was to be on display in the office was raised to the seventh floor by a hoisting company and taken in through a window.

Stickles Resigns from Holt-Welles—E. H. Stickels has resigned from the presidency of the Holt-Welles Co., Inc., selling agents of the Branford carbureter, and has sold his stock holdings in the company to the Malleable Iron Fittings Co., Branford, Conn. Mr. Stickels is contemplating entering the accessory field as factory representative.

Goodyear Employees Mobilize for Red Cross—A four-days' campaign for the Red Cross at the Goodyear plant resulted in more than 98 per cent of the force enrolling as members. In all 17,865 new members were obtained, and nearly $18,000 was contributed. This brings the Red Cross membership for Akron to 40,000, about 35 per cent of the population.

Gear Makers Hold Meeting—The recently-organized American Gear Manufacturers' Association held its first convention at Pittsburgh, Pa., May 14-15. S. L. Nicholson, of the Westinghouse Electric & Mfg. Co., James Gleason, William Ganschow and George L. Markland were speakers. The officers of the association are: President, F. W. Sinram, Van Dorn & Dutton Co., Cleveland, Ohio; vice-president, H. E. Eberhardt, Newark Gear Cutting Machine Co., Newark, N. J.; secretary, F. D. Hamlin, Earle Gear & Machine Co., Philadelphia, Pa., and treasurer, Frank Horsburgh, Horsburgh & Scott.

Mackie Is Called to Front—Mitchell Mackie, sales engineer for the Waukesha Motor Co., has been called to the front as captain of a motor truck squadron.

Auto Parts to Change Name—June 1 the Auto Parts Co., Providence, R. I., will change its name to Apco Mfg. Co. and increase its capital from $30,000 to $200,000.

Hughes With Indiana Truck—F. W. Hughes has been appointed production manager of the Indiana Motor Truck Co. at Marion, Ind. Mr. Hughes was formerly Detroit resident engineer for the Covert Gear Co.

Scripps-Booth Promotes Taneyhill—W. H. Taneyhill has been advanced from manager of the central district of the Scripps-Booth Corp. to that of assistant general sales manager.

Whyte Joins Bailey Differential—John Whyte, formerly engineer of battery service for the Prest-O-Lite Co., has been appointed chief engineer of the Bailey Non-Stall Differential Corp., Chicago.

Canadian Chalmers Ships First Trainload—The first trainload of Chalmers cars has been forwarded from the Canadian factory of the Chalmers Motor Co. of Canada, Ltd., Walkerville, Ont. The trainload consisted of ninety cars and was consigned to the Montreal Vehicle Co., Ltd.

Jordan Joins Bigelow-Waggoner Co.—Edward W. Jordan has joined the Bigelow-Waggoner Co., advertising agent, Indianapolis, Ind., as vice-president in charge of plan and copy departments. Mr. Jordan at one time was advertising manager of the Warner Instrument Co., later with the Curtis Co., then joining the Cramer-Krasselt Co., from which he has just resigned.

Goodyear Makes Promotions—C. M. McCreery, formerly assistant manager of the Chicago district of the Goodyear Tire & Rubber Co., Akron, Ohio, is now special manufacturers' representative for that district; W. S. Boone, formerly supervisor of city sales in Philadelphia, is now special manufacturers' representative for the New York district; G. H. Barmore has been transferred from branch manager at Milwaukee, Wis., to assistant manager of the Chicago district; A. J. Sears, formerly branch manager at Sioux City, Iowa, succeeds Mr. Barmore at Milwaukee; W. A. Ziegler has been promoted from city salesman at Milwaukee to branch manager at Sioux City, Iowa.

Cutler-Hammer Expands Plant—The Cutler-Hammer Mfg. Co., Milwaukee, Wis., is adding six new units to its plant. The first of the new units is a city block long and is constructed of fire-proof, reinforced concrete.

Brush to Sell Studebaker Retail—William T. Brush, assistant sales manager of the Studebaker Corp., has resigned and has purchased a half interest in the Philadelphia Sales Corp., distributor of Studebaker cars.

J. C. Wilson Co. to Increase Capital—The stockholders of the J. C. Wilson Co., Detroit, have voted to increase the capital stock to $1,000,000 to care for the increase in motor truck business and provide for further expansion.

Canadian Chalmers to Rebuild—The Chalmers Motor Co. of Canada has ordered construction of a new building adjacent to the remains of the factory which recently burned. The structure will be 325 ft. long and will cost $25,000.

Shaw Leaves Kentucky Wagon—W. I. Shaw, general sales manager of the Kentucky Wagon Mfg. Co. has resigned. He will rest for several months before taking up his connection with a large manufacturing company in New York.

Stephens Appoints Love to District—C. M. Love has been appointed district sales manager for the southern states in charge of Stephens Six sales, with headquarters at Atlanta, Ga. Mr. Love was with the Studebaker for nine years.

Globe Truck Makes Changes—Walter F. Sheehan, formerly chief engineer of the Mogul Truck Co., has been appointed general manager of the Globe Motor Truck Co., St. Louis, Mo. C. T. Schaefer has been added to the engineering department. The concern is producing a full line of 1-, 1½- and 2-ton trucks now.

Takes Entire Quayle Output—The Service Motor Supply Co., Chicago, has closed a contract with the manufacturers of the Quayle switch lock to take the entire factory output. The device is made specially for Ford cars and operates by pushing the lever at the top, after which it is unlocked by working a combination of buttons.

Piper to Manage Studebaker Branch—S. M. Piper, Buffalo, N. Y., is the new manager of the Louisville, Ky., branch of the Studebaker Corp. of America. He succeeds Wilson M. Taylor, an efficiency expert, who has been in temporary charge of the branch since its establishment several months ago. Mr. Taylor will return to the general office of the Studebaker at South Bend, Ind.

Maibohm Installs Body Machinery—The Maibohm Motors Co., Racine, Wis., is installing machinery for building bodies, as well as wood and metal working machinery, drying ovens, upholstery department and a new power plant. When the body-building machinery is completely installed an announcement of additional styles and body models is expected. Production at present is confined to the two-passenger roadster.

Federal Rubber Employees at War Front—Dominick Gregorelo, an Italian, was the sole support of his aged mother as he worked in the plant of the Federal Rubber Co., and when she wrote that she needed him at home Dominick dutifully packed his belongings and sailed for Italy. When the war opened Dominick went to the front, and when Gorizia was captured and prisoners were brought in, he met for the first time since he had left the Federal two old friends, Austrians, who had worked side by side with him in the Federal plant. The reunion that followed was as enthusiastic as if the friends had never been obliged to shoot at each other.